| Advisory Action Before the Filing of an Appeal Brief | Application No. 15/271,410 | Applicant(s) Proctor et al. | |
|---|---|---|---|
| | Examiner CRISTINA O SHERR | Art Unit 3685 | AIA (FITF) Status No |

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

THE REPLY FILED 22 April 2020 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☐ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection.The current period for reply expires ____ months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   *Examiner Note*: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☑ The Notice of Appeal was filed on 21 April 2020. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: _____ (See 37CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☑ Applicants reply has overcome the following rejection(s): The rejection under 112(b) for lack of antecedent basis
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☑ For purposes of appeal, the proposed amendment(s):(a) ☐ will not be entered, or (b) ☑ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☑ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on 21 April 2020
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☑ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☑ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☑ Other: See Continuation Sheet.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed:_____.
    Claim(s) objected to:_____.
    Claim(s) rejected:1-2,5,8,12-13,15,17,31,35,41-42 and 44-60.
    Claim(s) withdrawn from consideration:43.

| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |
|---|---|



Apple EX1004 (Part 4 of 5)
Apple Inc. v. Secure Comm. Techs., LLC
IPR2026-00445

Continuation of REQUEST FOR RECONSIDERATION/OTHER 12.

The request for reconsideration has been considered but does NOT place the application in condition for allowance because:

In this case, the declaration presents opinion evidence on the ultimate legal conclusions of whether the claims provide a sufficient written description under 35 USC 112(a) or whether the claims are indefinite under 35 USC 112(b). MPEP 716.09 states “Affidavits or declarations presented to show that the disclosure of an application is sufficient to one skilled in the art are not acceptable to establish facts which the specification itself should recite. In re Buchner, 929 F.2d 660, 18 USPQ2d 1331 (Fed. Cir. 1991),” and “Affidavits or declarations purporting to explain the disclosure or to interpret the disclosure of a pending application are usually not considered. In re Oppenauer, 143 F.2d 974, 62 USPQ 297 (CCPA 1944).” Here , in addressing the 112(a) rejections, the declaration states applicant’s opinion on how a person of ordinary skill would have interpreted the specification. Similarly, in addressing the 112(b) rejections, the declaration states applicant’s opinion on why a person of ordinary skill would find the cited claim language definite.

Regarding claim 31 and paragraphs 47-62 of the declaration explaining why applicant believes claim 31 is definite because the claim does not recite language which may or may not be done, please note that the cited language in claim 31 was identified as not having patentable weight or not serving to differentiate the claims from the prior art.

Regarding 112(a) rejection of claims 1 and 31 for reciting a mobile wireless device with a first radio and second radio, in paragraphs 63-103 of the declaration, the applicant points to the wireless links of Fig. 1 and paragraphs 39 and 43 of the PGPub. However, these portions discuss communications links, but do not disclose a mobile wireless device having a first radio and a second radio.

Regarding the 112(a) rejection of claim 13 for “downloading application software in response to sending the unique identifier to the server,” applicant states, in paragraphs 104-107 of the declaration, that paragraph 46 of the PGPub supports this limitation. However, claim 13 recites that “the identifier related information comprises application software for execution upon the mobile wireless device,” and then recites a step of “sending of the unique identifier,” and “in response to the sending of the unique identifier, downloading the application software.” Additionally, claim 1, on which claim 13 depends, recites “receiving , using the first radio, identifier related information….” Therefore, claim 13 requires that the application software, which is part of the identifier related information, to first be received by the first radio, and then be downloaded again after the unique identifier is received by the mobile device from the proximity beacon transmissions and sent to the server. Paragraph 46 does not disclose downloading the application software in response to sending the unique identifier to the server, where the downloading is in addition to receiving the application software as part of the identifier related information in claim 1. Paragraph 46 also does not disclose that the identifier sent to the server is the same identifier that corresponds to the “unique identifier” of claim 1 received as part of the proximity beacon transmission.

Regarding the 112(a) rejection of claims 45 and 50, in paragraphs 108-129 of the declaration, applicant points to paragraph 61 of the specification and step 706 of Figure 7 to correlate the “Device 2 Entity Identifier” EI2 to the “further information relating to the entity or object” in the step of “receiving further information relating to the entity or object associated with being within proximity to the mobile device.” Applicant then cited paragraph 61 and steps 706 and 707 of Figure 7 as support for the step of “ determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier.” However, step 706 is a single step, while the claim recites two distinct steps of “receiving further information…” and “

determining if an entity or object…is in proximity….” Additionally, step 707 only notifies a user that the entity is in proximity as a result of step 706, but does not perform “determining if an entity or object…is in proximity…” nor “receiving further information…” Additionally, the step of “determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device…” utilizes “the identifier related information and the unique identifier,” where the identifier related information was received from the server, and the unique identifier was received in the proximity beacon transmission in the claim. Steps 706-706 of Figure 7 and paragraph 61 of the specification do not disclose that these two identifiers (distinct from the Device 2 Entity Identifier EI2 which applicant has correlated to the “further information relating to the entity or object”) are used to perform “determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device…”

Regarding the 112(a) rejection of claims 44 and 46, in paragraphs 130-135 of the declaration, applicant points to paragraphs 47 and 49 of the pgpub as supporting both receiving identifier related information from the server as recited in claims 1 and 31, and preventing the sending of the unique identifier to the servers. However, par 47 recites determining which of the detected identifiers should be passed to the server. No "preventing" step is recited.

Regarding the 112(a) rejection of claim 57, in paragraphs 136-141 of the declaration, applicant states that the disclosure in paragraph 67 of the pgpub of specials being delivered to customers via email requires “ retrieving a stored user email address associated with an account associated with the mobile device; and sending an email, addressed to the user email address containing customized content based upon the stored proximity user behavior.” However, paragraph 67 does not disclose the particular steps recited in the claim, nor does it provide any indication that these particular steps would have to be performed for “ specials delivered via email.”

Regarding the 112(b) rejection of claims 1 and 31, in paragraphs 142-150 of the declaration, applicant argues that "respective" is not a relative term.

Please note the following definition ----
relative

adjective
1. comparative, considerable, reasonable, moderate, in comparison a period of relative calm
2. corresponding, comparable, respective, comparative, reciprocal, correlative the relative importance of education in 50 countries
3. (with to) in proportion to, corresponding to, proportionate to, proportional to The satellite remains in one spot relative to the earth's surface.
Collins Thesaurus of the English Language – Complete and Unabridged 2nd Edition. 2002 © HarperCollins Publishers 1995, 2002

Regarding the 112(b) rejection of claims 1 and 31, in paragraphs 151- 175, applicant argues that "in proximity" is not a relative term.
Please note the following definition --

proximity
noun
: the quality or state of being proximate : CLOSENESS

“Proximity.” Merriam-Webster Dictionary, Merriam-Webster

Note further that the term “proximity” is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably

apprised of the scope of the invention. In other words --- how close? And all we know from the specification is with the bounds of wifi or bluetooth, but not how far within the bounds, whether at the limits or at half that distance, etc.

Continuation of REQUEST FOR RECONSIDERATION/OTHER 14. Other: The affidavit, filed 20 April 2020 , is not persuasive - --

Written Description
Regarding claims 1 and 31 –

The claims recite a mobile wireless device “comprising” (i.e., storing) a first radio and a second radio. The Specification does not support the said recitation. (See PgPub US 2017/0011425 at par 11 reciting “two wireless devices”, also fig.1/106/108 disclosing two wireless devices). To satisfy the written description requirement, the specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing. (In re Katz Interactive Call Processing Patent Litigation, 97 USPQ2d 1737 (Fed. Cir. 2011)).

Regarding claims 1 and 31 –

The claims recite a mobile wireless device “comprising” (i.e., storing) one or more nontransitory memory devices. The Specification does not support the said recitation. (See PgPub US 2017/0011425 at par 41 reciting “memory”). To satisfy the written description requirement, the specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing. (In re Katz Interactive Call Processing Patent Litigation, 97 USPQ2d 1737 (Fed. Cir. 2011)).

New Matter

Claims 13, 44-46, 50, and 57 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.
16. Regarding claim 13 –
17. The Specification does not support performing downloading application software in response to sending the unique identifier to the server. (See PgPub US 2017/0011425 at par 99).
18. Regarding claims 45 and 50 –
19. Claims 45 and 50 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.
20. The Specification does not support performing "sending the unique identifier, using the first radio, to at least one server of the one or more servers," and "receiving further information relating to the entity or object associated with being within proximity to the mobile device," in a single method in the context of the rest of the claim, and specifically, in combination with also performing the steps of "receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions when the device is located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier, and a proximity beacon service identifier (PBSI)" and "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier associated with the particular short range transmission." (See PgPub US 2017/0011425 at par

111)
21. Regarding claims 44 and 46 –
22. The Specification does not support both receiving identifier related information from the server as recited in claims 1 and 31, and preventing the sending of the unique identifier to the servers as recited in claims 44 and 46. (See PgPub US 2017/0011425 at par 111)
23. Regarding claim 57 –
24. The Specification does not support the steps of “retrieving a stored user email” and “sending an email … based upon the stored proximity user behavior”. (See PgPub US 2017/0011425 at par 67)
28. Claims 1-2, 5, 8, 12-13, 15, 17, 31, 35, 41-42, and 44-60 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.
Relative Terms
29. Regarding claims 1 and 31 –
30. The terms “respective MAC Address”, “respective unique identifier" and “determining . . . is in proximity " in claims 1 and 31 are relative terms which render the claim indefinite. The terms "respective" and “ proximity” are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
31. Regarding claim 1 –
32. The term “determining . . . is in proximity . . ." in claim 1 is a relative term which renders the claims indefinite. The term “proximity” is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
33. Regarding claim 31 –
34. The term “determining . . . is within proximity . . ." in claim 31 is a relative term which renders the claims indefinite. The term “proximity” is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
35. Regarding claims 45 and 50 –
36. The term “receiving . . . within proximity . . ." in claims 45 and 50 is a relative term which renders the claims indefinite. The term “proximity” is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
Missing Step
37. Regarding claim 13 –
38. Claim 13 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are as follows:

- Claim 13 recites that “downloading” is performed “in reaction to sending of the unique identifier,” but claim 1 does not include a step of sending the unique identifier to the server.
Unclear Scope
39. Regarding claim 1 –
40. Claim 1 is directed to “A mobile wireless device”. However, the body of the claim also recites “ receiving… when the device…”, “determining… is in proximity to the mobile wireless device” and “ receiving… to the mobile device”. The scope of the claim is thereby rendered unclear, as the scope of the mobile wireless device is defined in terms of the device itself.
Hybrid Claims
41. Regarding claim 1 –
42. A single claim which purports to be both a product or machine and a process is ambiguous and is properly rejected under 35 USC 112, second paragraph, for failing to particularly point out and distinctly claim the invention. Ex Parte Lyell, 17 USPQ2d 1548 (B.P.A.I. 1990).

43. In this case, claim 1 is directed to a “mobile wireless device” and further recites “receiving… when the device is located within a detection range…”, rendering the claim ambiguous.

Lack of Antecedent Basis

44. Claim 17 recites the limitation "the first and second unique" in line 6 of the claim. There is insufficient antecedent basis for this limitation in the claim.

OK TO ENTER: /C.O.S/

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of:<br>James A. Proctor, Jr., et al. | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

**AMENDMENT AFTER NOTICE OF APPEAL**
**PURSUANT TO 37 CFR 41.33**

Appellant hereby submits this Amendment after the Notice of Appeal filed on April 21, 2020.

**Amendments to the Claims** begin on page 2.

**Remarks** begin on page 11.

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 06/10/2020

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| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
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| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 06/10/2020 | ELECTRONIC |

**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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

Application Number: 15/271,410
Filing Date: 21 Sep 2016
Appellant(s): Proctor et al.

David J. Thibodeau, Jr., RegNo 31,671
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed April 27, 2020.

**(1) Grounds of Rejection to be Reviewed on Appeal**

Every ground of rejection set forth in the Office action dated January 22, 2020, from which the appeal is taken is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner.

In view of the Applicant's Amendment, filed April 22, 2020, the rejection of claim 17, under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, for Lack of Antecedent Basis, is hereby withdrawn.

**(2) Response to Argument**

***First Issue***

Appellant argues, regarding claims 1 and 31, that the claims are properly supported by the Specification. Specifically, Appellant argues, that the Specification discloses a mobile wireless device with a first radio and second radio. Further, the applicant points to the wireless links of Fig. 1 and paragraphs 39 and 43 of the PGPub.

Examiner respectfully disagrees.

Note that these portions discuss communications links, but do not disclose a mobile wireless device having a first radio and a second radio.

***Second Issue***

Appellant argues, regarding claims 1 and 31, that the Specification properly supports a mobile wireless device comprising one or more nontransitory memory devices.

Examiner respectfully disagrees.

The claims recite a mobile wireless device "comprising" (i.e., storing) one or more nontransitory memory devices. The Specification does not support the said recitation. (See PgPub US 2017/0011425 at par 41 reciting "memory"). To satisfy the written description requirement, the Specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention at the time of filing. (*In re Katz* Interactive Call Processing Patent Litigation, 97 USPQ2d 1737 (Fed. Cir. 2011)).

Appellant further argues that the terms "storage," "memory," and "disk" in paragraph 41 provide support for the "one or more non-transitory memory devices" of the claim. Note that paragraph 41 of the pregrant publication of the Specification in this case mentions that the internal components of a computer system can include disk storage and memory. This makes a distinction between disk storage

and memory, and only provides support for the computer system having a single "memory". Claim 1 recites a mobile wireless device having "one or more non-transitory memory devices," which reads on a mobile wireless device having more than one non-transitory memory device. Additionally, this limitation of the claim specifically recites "memory devices" as opposed to other forms of storage media. The Specification does not provide support for a mobile wireless device having more than one non-transitory memory device because it recites that the computer system has only a single memory. The "disk storage" is disclosed as being distinct from the "memory" in paragraph 41 of the pregrant publication of the Specification, and thus cannot provide support for a second "memory device."

***Third Issue***

Appellant argues, regarding claim 13, that the feature, "downloading application software in response to sending the unique identifier to the server," is properly supported by the Specification. Specifically, Appellant states, that paragraph 46 of the PGPub supports this limitation.

Examiner respectfully disagrees.

Claim 13 recites that "the identifier related information comprises application software for execution upon the mobile wireless device," and then recites a step of "sending of the unique identifier," and "in response to the sending of the unique identifier, downloading the application software." Additionally, claim 1, on which claim 13 depends, recites "receiving, using the first radio, identifier related information…." Therefore, claim 13 requires that the application software, which is part of the identifier related information, to first be received by the first radio, and then be downloaded again after the unique identifier is received by the mobile device from the proximity beacon transmissions and sent to the server. Paragraph 46 of the PgPub does not disclose downloading the application software in response to sending the unique identifier to the server, where the downloading is in addition to receiving the application software as part of the identifier related information in claim 1.

Paragraph 46 also does not disclose that the identifier sent to the server is the same identifier that corresponds to the "unique identifier" of claim 1 received as part of the proximity beacon transmission.

***Fourth Issue***

Appellant argues, regarding claims 45 and 50, that the feature of "sending the unique identifier, using the first radio, to at least one server of the one or more servers," and "receiving further information relating to the entity or object associated with being within proximity to the mobile device," in a single method in the context of the rest of the claim, and specifically, in combination with also performing the steps of "receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions when the device is located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier, and a proximity beacon service identifier (PBSI)" and "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier associated with the particular short range transmission", is properly supported by the Specification. More specifically, Appellant points to paragraph 61 of the Specification and step 706 of Figure 7 to correlate the "Device 2 Entity Identifier" EI2 to the "further information relating to the entity or object" in the step of "receiving further information relating to the entity or object associated with being within proximity to the mobile device." Appellant then cites paragraph 61 and steps 706 and 707 of Figure 7 as support for the step of "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier."

Examiner respectfully disagrees.

Step 706 of Figure 7 is a single step, while the claim recites two distinct steps of "receiving further information…" and "determining if an entity or object…is in proximity…." Additionally, step 707

only notifies a user that the entity is in proximity as a result of step 706, but does not perform "determining if an entity or object…is in proximity…" nor "receiving further information…" Also, the step of "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device…" utilizes "the identifier related information and the unique identifier," where the identifier related information was received from the server, and the unique identifier was received in the proximity beacon transmission in the claim. Steps 706-707 of Figure 7 and paragraph 61 of the Specification do not disclose that these two identifiers (distinct from the Device 2 Entity Identifier EI2 which applicant has correlated to the "further information relating to the entity or object") are used to perform "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device…"

Further, appellant maps the SSID to the "unique identifier" of the claim on pp. 18-20 of the brief when describing the content of the "proximity beacon transmissions" for the step of "receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions," but then identifies a different item, identifier DI2, as corresponding to the "unique identifier" in the step of "sending the unique identifier, using the first radio, to the server" on pp. 20-21 of the brief. However, the claim requires that these be the same identifier.

Appellant also maps EI2 to the "further information" for the step of "receiving further information relating to the entity or object…," on p. 20 of the brief, but then maps the same identifier EI2 to the "identifier related information" for the step of "determining if an entity or object associated with the proximity beacon service is in proximity to the mobile device, by utilizing identifier related information and the unique identifier…" on p. 21 of the brief. However, the claim makes a distinction between "further information" and "identifier related information."

Additionally, appellant states on p. 21 of the brief that "a 'user application' running on the mobile device then uses the detected unique identifier (DI2) and the entity-related information (EI1)

returned from the server…." However, neither Figure 7 nor its description in the Specification indicates that EI1 is returned from the server to Device 1 of Figure 7.

***Fifth Issue***

Appellant argues, regarding claims 44 and 46, that the Specification properly supports the features of receiving identifier related information from the server as recited in claims 1 and 31, and preventing the sending of the unique identifier to the servers. Specifically, Appellant points to paragraphs 47 and 49 of the pregrant publication as supporting both receiving identifier related information from the server as recited in claims 1 and 31, and preventing the sending of the unique identifier to the servers.

Examiner respectfully disagrees.

Paragraph 47 of the PgPub recites determining which of the detected identifiers should be passed to the server. No "preventing" step is recited.

***Sixth Issue***

Appellant argues, regarding claim 57, that the feature of retrieving a stored user email address associated with an account associated with the mobile device; and sending an email, addressed to the user email address containing customized content based upon the stored proximity user behavior. Is properly supported by the Specification. Specifically, Appellant argues that that the disclosure in paragraph 67 of the pregrant publication of the Specification being delivered to customers via email requires "retrieving a stored user email address associated with an account associated with the mobile device; and sending an email, addressed to the user email address containing customized content based upon the stored proximity user behavior."

Examiner respectfully disagrees.

Paragraph 67 does not disclose the particular steps recited in the claim, nor does it provide any indication that these particular steps would have to be performed for "specials delivered via email."

***Seventh Issue***

Appellant argues, regarding claims 1 and 31 that the claims are neither vague nor unclear. Specifically, Appellant argues that that "respective" is not a relative term.

Examiner respectfully disagrees.

Please note the following definition ----

Relative (adjective)

1. comparative, considerable, reasonable, moderate, in comparison a period of relative calm

2. corresponding, comparable, respective, comparative, reciprocal, correlative the relative importance of education in 50 countries

3. (with to) in proportion to, corresponding to, proportionate to, proportional to The satellite remains in one spot relative to the earth's surface.

Collins Thesaurus of the English Language – Complete and Unabridged 2nd Edition. 2002 © HarperCollins Publishers 1995, 2002.

Relative terms such as “respective” and others do not convey a positive description. These and other similar terms will instead only provide a relational description. When using this type of relative terminology you are not describing the action, item, or element itself directly, but rather you are describing in terms of what it has in common with something else, thereby rendering the claim unclear.

***Eighth Issue***

Appellant argues, regarding claims 1 and 31 that the claims are neither vague nor unclear. Specifically, Appellant argues that that "in proximity" is not a relative term.

Examiner respectfully disagrees.

Please note the following definition --

proximity (noun)

: the quality or state of being proximate : CLOSENESS

“Proximity.” Merriam-Webster Dictionary, Merriam-Webster

Note further that the term "proximity" is not defined by the claims, the Specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. In other words --- how close? And all we know from the Specification is with the bounds of wifi or bluetooth, but not how far within the bounds, whether at the limits or at half that distance, etc.

Further, relative terms such as "proximity" and others do not convey a positive description. These and other similar terms will instead only provide a relational description. When using this type of relative terminology you are not describing the action, item, or element itself directly, but rather you are describing in terms of what it has in common with something else, thereby rendering the claim unclear.

***Ninth Issue***

Appellant argues, regarding claim 13, that the said claim does not have a missing step.

Examiner respectfully disagrees.

Claim 13 recites that "downloading" is performed "in reaction to sending of the unique identifier," but claim 1 does not include a step of sending the unique identifier to the server. Neither claim 1, from which claim 13 depends, nor claim 13 state where, when or by whom or what device the unique identifier is sent. The scope of the claim is therefore unclear.

***Tenth Issue***

Appellant argues, regarding claim 1, that it is proper for the claim to be defined in terms of itself.

Examiner respectfully disagrees.

Claim 1 is directed to "A mobile wireless device". However, the body of the claim also recites "receiving… when the device…", "determining… is in proximity to the mobile wireless device" and

"receiving… to the mobile device". The scope of the claim is thereby rendered unclear, as the scope of the mobile wireless device is defined in terms of the device itself.

***Eleventh Issue***

Appellant argues, regarding claim 1, that the claim is not a hybrid claim.

Examiner respectfully disagrees.

In this case, claim 1 is directed to a "mobile wireless device" and further recites "receiving… when the device is located within a detection range…", rendering the claim ambiguous. In other words, the claim is directed to a "mobile wireless device" and also recites an action "is located within . . .", which is not attributed to any of the structural elements of the "mobile wireless device". *UltimatePointer, LLC v. Nintendo Co.*, 118 USPQ2d 1125 (Fed. Cir. 2016); *Rembrandt Data Techs., LP v. AOL, LLC*, 641 F.3d 1331, 98 USPQ2d 1393 (Fed. Cir. 2011).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Cristina Owen Sherr, AU 3685 /COS/

Conferees:

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

/CALVIN L HEWITT II/
Supervisory Patent Examiner, Art Unit 3685

**Requirement to pay appeal forwarding fee.** In order to avoid dismissal of the instant appeal in any application or ex parte reexamination proceeding, 37 CFR 41.45 requires payment of an appeal forwarding fee within the time permitted by 37 CFR 41.45(a), unless appellant had timely paid the fee for filing a brief required by 37 CFR 41.20(b) in effect on March 18, 2013.

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

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| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 06/22/2020 | ELECTRONIC |

**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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

| *Applicant-Initiated Interview Summary* | **Application No.** 15/271,410 | **Applicant(s)** Proctor et al. | |
|---|---|---|---|
| | **Examiner** CRISTINA O SHERR | **Art Unit** 3685 | **AIA (FITF) Status** No |

All participants (applicant, applicants representative, PTO personnel):

(1) CRISTINA OWEN. SHERR. (3) _____.

(2) DavidJ Thinodeau, Jr RegNo 31,671. (4) _____.

Date of Interview: 09 June 2020.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☑Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Discussion of status of Advisory Action, response to Declaration, and Examiner's Answer to Appeal Brief..

**Applicant recordation instructions:** The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

**Examiner recordation instructions**: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |
|---|---|

# Summary of Record of Interview Requirements

**Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record**
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

**Title 37 Code of Federal Regulations (CFR) 1.133 Interviews**
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

---

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

**Examiner to Check for Accuracy**

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of: James A. Proctor, Jr., et al.

Serial No.: 15/271,410 Examiner: Sherr, Cristina Owen

Filed: September 21, 2016 Art Unit: 3685

Confirmation No: 7653

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION DEVICES TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

# REPLY BRIEF UNDER 37 CFR §41.41

Appellant hereby submits a Reply Brief ("Reply") in response to the Answer ("Answer") dated June 10, 2020. Appellant requests that the appeal be maintained. The appeal forwarding fee under 37 CFR §41.45 is enclosed.

To assist with the Board's further review of this Appeal, the issue numbering adopted for the first time in the Answer has been maintained in this Reply.

## *Status of the Claims*

The rejection of claim 17 for lacking antecedent basis has been withdrawn.

## *Introduction*

The sweeping statement in the Answer that "Every ground of rejection set forth in the Office action dated January 22, 2020, is being maintained" does not operate to relieve the Patent Office from its burden of addressing each and every argument in the Appeal Brief filed April 27, 2020 (the "Brief").

An overarching example of this failure concerns the Declaration of James A. Proctor ("Proctor") filed April 20, 2020 (the "Proctor Declaration" or "Proctor Decl.") properly admitted into evidence per Manual of Patent Examining Procedure (MPEP) 716.01(A)(1) (submitted prior to a final rejection). However , the Answer gives absolutely no consideration to Mr. Proctor's fact testimony whatsoever.

Evidence of fact traversing rejections, when timely presented, must be considered by the Examiner whenever present. Where the evidence is insufficient to overcome the rejection, the Examiner must specifically explain why the evidence is insufficient. General statements without an explanation supporting such findings are insufficient. See MPEP 716.01(b and MPEP 716.01(c) citing to *In re Chilowsky,* 306 F.2d 908, 134 USPQ 515 (CCPA 1962) (an expert opinion (e.g., "on the ultimate conclusion") that an application meets the requirements of 35 U.S.C. 112 is not entitled to any weight; however, facts shown therein that provide a basis for deciding that the specification complies with 35 U.S.C. 112 are entitled to at least some weight).

An affidavit of an applicant as to the patentability of his or her own claimed invention, while less persuasive than that of a disinterested person, ***cannot be disregarded for that reason alone.*** *Ex parte Keyes*, 214 USPQ 579 (Bd. App. 1982); *In re McKenna*, 203 F.2d 717, 97 USPQ 348 (CCPA 1953) as cited in MPEP 716.01(c) III.

See also *In re Weber*, 341 F.2d 143, 52 CCPA 1015 (1965) where one of the affidavits contained a sworn statement, made of the affiant's own knowledge, that the average computer programmer is familiar with subroutines for running integration. In the absence of a challenge to the affiant's qualifications or, at the *very least, a contrary inference by the board or Examiner from other evidence*, the appeals court found they were unable to uphold the rejection of the claims.

MPEP 2164.06(c) III is also instructive. When USPTO personnel question the adequacy of computer system or computer programming disclosures, the reasons for finding the specification to be non-enabling should be supported by the record as a whole. In this regard, it is also essential for USPTO personnel to reasonably challenge evidence submitted by the applicant. Citing to *In re Naquin*, supra, and *In re Morehouse*, 545 F.2d 162, 165-66, 192 USPQ 29, 32 (CCPA 1976).

The ultimate determination of patentability must be based on consideration *of the entire record, by a preponderance of evidence,* with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker,* 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

***First Issue***

In addition to ignoring the testimony of Mr. Proctor, the Answer also fails to consider how a person of skill in the art ("POSITA") interprets the claims, giving the claims their broadest reasonable meaning in view of what the specification shows.

The last Office Action, a non-final action dated January 22, 2020 (the "last Office Action"), had argued that the claims encompass two wireless devices. In response to that, the Brief explained why example claim 1 actually recites a single "mobile wireless device" that comprises "a first radio" and "a second radio" (emphasis supplied). The Answer does not further address this issue – and therefore it should be deemed to have been admitted.

However, the Answer still argues that there is no support for the single wireless device having a first and second radio. We disagree.

First, the Answer overlooks the fact that the specification explicitly states that the wireless device uses a radio to provide the first short range "capability". As one example, see the specification at Paragraph [0011] (a copy of which was included as Exhibit F to the Brief) :

> *"In one embodiment, this can be accomplished by a first device using a first short range wireless capability to detect an identifier transmitted from a second device in proximity to the first device, ideally using existing short range radio communication standard capabilities such as Bluetooth (IEEE802.15.1-2002) or Wi-Fi (IEEE802.11)."*

It is also said later on in the specification (when referring to FIG. 2) that the central server 100 is connected to the cellular network 101, and is "able to communicate information to and from wireless device 202 using a wide area wireless link such as IS-2000, WCDMA, GPRS, EDGE, LTE, Wi-Max (IEEE802.16)" Spec. at [0045]. This is evidence that the specification also teaches one of skill in the art that the device must have the claimed "second radio".

One of skill in the art understands that "wireless" in this context, means using a radio (as opposed to wires or cables) to transmit signals.

Note also the following dictionary definition for "wireless":

> Wireless *adj*. 1: Having no wire 2: Relating to communication by electrtic waves but without connecting wires
> Wireless *n*. 1: Wireless telegraphy. 2: RADIO.

Webster's Beginning Dictionary © 1980, G &C Merriam Co., page 794

Therefore, "wireless" means "radio" both in the sense of a general definition and in the context of the specification.

A person of skill in the art would therefore equate the specification's reference to a "wireless" link to mean that a "radio" is inherent to a device participating in such communications.

The Answer offers no contrary evidence whatsoever, other than an unsupported, bald statement that the specification "does not disclose a mobile wireless device having a first radio and a second radio".

There is also nothing on the record to rebut Mr. Proctor's testimony that a person of ordinary skill in the art (POSITA) would readily conclude that mobile device 106 must have both a "first radio" to communicate over link 107 as described (labelled as being a Local Link, Wi-Fi, Bluetooth, etc.) and a "second radio" to communicate over the wireless wide area link 104 (labelled as being a WWLAN (Wireless Wide Area Network) Link 104). (See Proctor Decl. at Par. 80 and 81.)

A person of ordinary skill in the art would understand that the disclosure of a device that utilizes a wide area link using certain cellular network protocols and a short range link utilizing different local link protocols, as discussed above, would inherently have two different radios.

The Answer also offers no reason why each of "lightning bolts" (103,104, and 107) in Figure 1 are not further evidence that POSITA understands wireless communication is taking place between the devices connected by the lightning bolts -- and thus each device would have to have the necessary radios to "use" each of the links. See also the Proctor Decl. at Par. 83).

The Board may take notice of the fact that as of the earliest claimed September 8, 2008 filing date of the application, both the first and second generation of Apple iPhones were in widespread use in the United States. It was therefore known even among the general public that for example a Bluetooth radio and cellular radio – providing several options for the claimed "two radios" - were standard components in a typical smart phone as referred to in the specification.

***Second Issue***

The Answer frames this issue differently from how it was presented in the last office action. The Patent Office now argues here for the first time that the specification only provides support for the computer system to have a single "non-transitory memory" (as opposed to whether the "memory" is transitory or non-transitory as argued in the Last Office Action.)

Because of this restatement of the issue in the Answer, additional arguments submitted herewith are therefore timely.

(A) First, the Answer errs again in failing to note that claim 31 is a method claim and does not actually recite any "memory device". At least the rejection of claim 31 on this basis must be withdrawn.

(B) The Answer is also mistaken in concluding that the specification "recites the computer system must have only a single memory device" when it considers an incomplete portion of paragraph [0041] of the specification. What paragraph [0041] actually says is:

> *"The internal structure of devices 106, 108 or server 100 includes one or more data processors (not shown in detail) that are well known in the art to include a system bus for data transfer among the other internal components of a computer system (e.g., processor, disk storage, memory, input/output ports, network ports, etc.)*

The specification therefore does explain that the processors include "memory" – but it contains no such requirement for a single memory device – such as a single memory chip.

A POSITA understands that the reference to "memory" in the context of discussing the architecture of a computer would not necessarily be limited to a single memory chip. Nothing in the specification suggests the contrary.

(C) Certainly the passage of the specification cited above supports at least that each of the described "one or more processors" has its own respective "memory". Therefore, the one or more processors thus have their corresponding one or more memories. The claims are read in light of the specification -- which must be given its broadest reasonable interpretation.

(D) Furthermore, one of skill in the art also would have understood that the "memory" used for storing instructions within well known data processors includes more than one memory type. For example, the Board can note the fact that processors based on the popular Intel Pentium architecture as of at least September 9, 2008 were well known to have a BIOS, a system memory, and multiple levels of cache (Layer 1 and Layer 2) that may all be used for storing code.

***Third Issue***

Claim 13 depends from claim 1 and is therefore directed to a more specific embodiment than claim 1.

First, the preamble of claim 13 simply serves to further define that the "identifier related information" includes "application software".

The first step of Claim 13 is an added step of "sending the unique identifier" to at least one server.

The second and final step of Claim 13 serves to define two further aspects of the invention. It (a) specifies the order of the steps (e.g., the "sending" step occurs "before" the "downloading" step (2) and further defines the receiving step as a downloading step. "Receiving" application software is often referred to by a POSITA as "downloading it".

This interpretation of the claim is consistent with the embodiment described in Paragraph [0046]. In that example, a mobile device 202 receives an identifier from a museum's broadcast device 204. The device 202 then passes that identifier "for" the museum device to the server 100 – and the server then "passes relevant information back to the user's device 202". The relevant information passed back, i.e., the "content" can include "text, pictures, web pages, and application software such as games, informative display applications or other content." This single flow of operations - receiving an identifier, passing the identifier to the server, and then receiving application software – is exactly consistent with the steps recited in claim 13.

Claim 13 requires that the identifier related information comprise application software. This also confirms that the downloading step is meant to further define the receiving step, which is for "receiving the identifier related information" -- and hence the application software as well.

The interpretation of claim 13 urged in the Answer – that the application software MUST be downloaded again, a second time – is therefore inconsistent with both the specification and with the claim language itself.

***Fourth Issue***

This issue touches only dependent claims 45 and 50 and does not concern the validity of the independent claims 1 and 31 from which they respectively depend.

(A) As testified to by Mr. Proctor, the example coherent method consists of not just steps 706 and 707 – but rather the four numbered steps 704, 705, 706, 707. These are illustrated as being executed in sequence in Figure 7, which must also be interpreted in the context of the other figures (such as Figs. 1, 4, 5 and 6 that were discussed prior to paragraph [0061]. See Proctor Decl. at 111-129.)

The Answer offers no reason why these other parts of the specification should not be considered when interpreting the claims.

What claim 45 actually says is (claim 50 is analogous):

> *45. The mobile wireless device of Claim 1, wherein the instructions further comprise:*
> *sending the unique identifier, using the first radio, to at least one server of the one or more servers, and*
> *receiving further information relating to an object or entity associated with being within proximity to the mobile device.*

When read in the context of claim 1, the scope of claim 45 is clear. The wireless device receives two things back from the server in some embodiments – BOTH "the identifier related information" (as per independent claim 1) AND the "further information" (as per claim 45).

The embodiment of Fig. 9, and in particular step 907, is illustrative of claim 45. It is an example where EI2 (the exemplary claimed "identifier related information") plus other content as the exemplary claimed

"further information" (e.g., the illustrated "entity details, name etc. and request - display content) are both received.

See also the following sentence in paragraph [0090] of the specification which explains, in this embodiment, that two things are returned – both the identifier related information (indicating the presence of the detected device) AND the available content (the claimed "further information"):

> *"Server 901 then transmits a Response message 907 indicated the presence of the detected device and the content available."*

Paragraph [0046] also actually supports a non-limiting interpretation of what the returned content may include. In this example it isn't simply the identifier related information, but may also include:

> "text, pictures, web pages, application software such as games, informative display applications, or other content such as audio or video to be offered to the user's device as well. Other examples might include electronic coupons (such as in a grocery store), menus or special offers in a restaurant."

Other example interpretations may define the identifier related information and the further information to include the above information types in alternative arrangements.

There is no legal requirement that a dependent claim be directed to exactly the same single embodiment as the independent claim from which it depends. "The features or functions of (a single) embodiment should not be read into the claims …. (without) a clear and unmistakable disavowel in the patent specification or the prosecution history. *Continental Circuits LLC v. Intel Corp.*, 915 F.3d 788, 795 (Fed. Cir. 2019).

The Answer also offers no legal authority for its conclusion that every step or every element in a claim ***must*** be represented by a corresponding block in a drawing. As long as one of skill in the art would have understood the invention, taking into account both the drawings and the corresponding text, the claim is enabled. See *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301 (Fed. Cir. 1999) as cited in MPEP 2111.01 (the meaning of words used in a claim is not construed in a "lexicographic vacuum", but in the context of both the specification and drawings"). It is entirely appropriate for a single

block in a drawing to represent two or more claim steps, if that is how a POSITA would interpret the claim.

The Answer's conclusion that:

> "Additionally, step 707 only notifies a user that the entity is in proximity as a result of step 706, but does not perform "determining if an entity or object...is in proximity..." nor "receiving further information..."

is also illogical. It is submitted that a POSITA would know from the other parts of the specification that the device must first "conclude" that the entity is in proximity before it can "notify" the user of such proximity. Again, see the Proctor Decl. at Par [111-129].

(B) The Answer also argues that claim 45 presents a conflicting definition for the "unique identifier". Claim 45 does not further "define" the unique identifier – it merely requires that the unique identifier that was received from the second radio, is then sent to the one or more servers. In other words, "the unique identifier" referred to in the "sending step" (claim 45 at line 2) is clearly the same "unique identifier" referred to claim 1 at line 15 as being received from the second radio.

The Answer also specifically mentions "DI2" as supposedly some evidence of inconsistency. DI2 is not mentioned in the claims. It is however, consistently referred to in some embodiments in the specification as the detected unique identifier. Paragraph [0061] explains that

> *"The first individual associated with Device 1 (702) referred to as Entity 1 (EI1) performs a detection process as described in FIGS. 4, 5, and 6 previously (step 704) the device identifier associated with Device 2 (703),* ***DI2*** *is thereby detected" (emphasis supplied) .*

See also Fig. 8 and Par. [0062] ("In step 804 the customer's device 802 (Device 1) performs an identifier search process as previously described, and detects a device identifier 2 (DI2) sent from Device 2 (803)…" and Fig. 9 and Par. [0069] ("In this example, an individual 902 is in a grocery store and their device 902 (Device 1) performs a scan for identifiers in step 904, as described previously. DI2 is detected having been transmitted from device 2 (903)."

Thus different embodiments are taught for transporting the claimed "unique identifier" (and hence DI2)[1].

The POSITA was therefore taught that the "unique identifier" can also be contained in the SSID field (in one embodiment) or it can be contained in one or more of the SSID and BSSID fields (in other embodiments), and elsewhere in yet other embodiments. The Appellant is entitled to draft a claim that covers more than one embodiment.

Thus, in the context of one embodiment, DI2 ***is the SSID***. The two terms are not mutually exclusive. "DI2" is simply used in the specification as a generic way to refer to the different embodiments of the claimed "unique identifier".

(C) The reference to "EI1" on page 21 of the Brief as the "identifier related information" was a typographical error. It should have referenced "EI2" as what is returned to the mobile device when the server "responds" in the Fig. 7 embodiment.

Notwithstanding the error in the Brief, it is the case here that the facts on record, such as stated in the Proctor declaration, are consistent. See the Proctor Decl. at 126-128, where Mr. Proctor explained that the following section of the specification at Par. [0061] teaches that EI2 is what is returned by the server:

> *"The server having determined that EI1 wants to be notified and is allowed to be notified responds in Step 706 to Device 1 (702) with a message indicating the DI2 is relevant to EI1 and including information such as Entity Identifier EI2 and associated details. A user application on Device 1 (702) notifies the user that the entity associated with Device 2 is in proximity in step 707."*

As already explained above, the specification also teaches other embodiments (such as that in step 907 of Fig. 9) where more than one piece of information is returned to the device, in response to having sent the unique identifier to the server.

---

[1] As was explained in the Brief, the "unique identifier" can also be physically transmitted as a field within the SSID (in one embodiment) or it can be contained in one or more of the SSID and BSSID fields (in other embodiments). See Proctor Decl. at 123-124, as well as Brief at pp.22-24.

Claim 50 depends from claim 31 and contains analogous language as claim 45. It is therefore patentable for the same reasons.

To the extent that any remaining arguments in the Answer concerning claims 45 and 50 are based on an erroneous interpretation of the claims, such arguments are irrelevant.

***Fifth Issue***

The Applicant is entitled to be his own lexicographer, and equate "not sending a subsequent request" described in the specification as support for "preventing the sending of a subsequent request" as recited in the claim.

The Answer also fails to directly consider how embodiments of the "action function" are described in the specification. In the example embodiment described in paragraphs [0047-0048], an "action function" is said to be used to reduce the frequency of re-requests to the server, for example, by not submitting a subsequent request to the server for "previously received" identifiers that have already been passed to the server. See also Proctor Decl. at Par. 130-135.

There is no requirement that the words in the claim exactly match analogous terms used in the specification. *Vitronics Corp. v. Conceptronic,* 90 F.3d 1576, 1582 (Fed. Cir. 1996).

***Sixth Issue***

Here, the Answer fails to accurately state the Applicant's argument, and also fails to consider the testimony of Mr. Proctor.

One of skill in the art understands, after reading paragraph [0067] that the service can track "prior habits" of an account holder and "cater" to them by delivering "specials" via email. Proctor Decl. Par. 139. A POSITA also understands that for the server to be able to send an email, it must have previously stored the email address. Proctor Decl. Par. 140.

As explained by the Supreme Court in *KSR Int'l Co.v.Teleflex Inc* 550 U.S. 398 (2007), "A person of ordinary skill in the art is also a person of ordinary creativity, not an automaton..." 550 U.S. at 421.

Furthermore "the inferences and creative steps that a person of ordinary skill in the art would employ" must also be considered when evaluating what a POSITA would have understood. 550 U.S. at 419.

***Seventh Issue***

The Answer offers no reason why the dictionary definition evidence previously submitted by the Appellant for "respective" as "pertaining individually or severally to each of a number of persons, things, etc.; particular" is to be ignored.

The Board should note that the Answer's citation to the Collins Dictionary is for the word "relative" – not the actual word that appears in the claims – which is the word "respective". For that reason alone, the Answer is not persuasive.

But consider that the definition of the word "relative" referenced in the Answer actually equates the word "respective" to another word -- "corresponding". That interpretation is thus actually consistent with the Applicant's arguments.

In other words, the term "respective" is used by the Appellant in the customary way for patent claims, as an attributive adjective – meaning a feature that concerns or is appropriate or "corresponds" to each of the things listed.

The Answer also fails to consider the use of the word "respective" in the context of the entire claim. Here the part of the claim that follows the term "respective" most definitely and clearly positively describes each "proximity beacon transmission" – that is, as having its own "corresponding" MAC address and unique identifier. See also Proctor Decl. at 123-126.

***Eighth Issue***

The Answer continues to err in overlooking that the claim itself actually defines what is meant by "proximity".

Neither the claim nor the specification calls for measuring some physical distance or relative closeness between devices – instead, claim 1 must be considered for what it actually says --

*determining if a particular short range transmission of the plurality of short range transmissions a) includes a MAC address, and b) includes the proximity beacon service identifier (PBSI) and if c) the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service;*

*then:*

*determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier.*

Namely, when three things are true (short range transmission has a MAC address, and that transmission also a PBSI, and that the PBSI indicates association with the proximity beacon service) -- that fact is then used together with received "identifier related information" and the "unique identifier" to conclude that a device associated with that beacon service is "in proximity".

This interpretation fits squarely within the corresponding parts of the specification, including at least Fig. 7 and Pars. [0043] and [0061] as was explained in the Brief. See also Proctor Decl. at Par. 162-175.

The Answer offers no reason why the words of the claim itself should be ignored; or why the claim should be interpreted in a way that is inconsistent with the specification; or any reasons why Mr. Proctor's interpretation is incorrect and should be ignored.

***Ninth Issue***

It is indeed true that claim 1 does not recite that "downloading" is performed before "sending the unique identifier". But Claim 13 itself most definitely does recite where, when, by whom, and by what device the unique identifier is sent.

The preamble at line 4 of claim 13 defines by whom steps are performed – namely, the mobile device.

Lines 4 and 5 of claim 13 provide a precise destination for the unique identifier – at least one server of the one or more servers".

And claim 13 also explicitly defines "when" the unique identifier is sent. It has to be sent after it "receives" it from the second radio (as recited in claim 1 at line 15) , and before the downloading step (which claim 13 itself requires to happen in "response" to the sending step).

***Tenth Issue***

As pointed out by the Supreme Court in *Markman et al. v. Westview Instruments Inc., et al*, "A claim covers and secures a process, a machine, a manufacture, a composition of matter, or a design …" and "define[s] the scope of a patent grant". *Markman* 517 U.S. 370, 373 (1996).

It is axiomatic therefore, that the claims define, in technical terms, the extent, i.e. the scope, of the protection conferred. To the extent that the Last Office Action or the Answer purport to assert that the claim itself should not define the scope of the inventive device, it is an incorrect statement of the law. No case contrary to *Markman* is cited by the Patent Office.

The fact that the claim 1 is directed to a device that includes a computer processor for performing a series of steps does not in and of itself render the claim unclear. The Answer also offers no reason why the Court of Appeals for the Federal Circuit's decisions in *MasterMine Software, Inc. v. Microsoft Corp.*, _ 874 F.3d 1307 (Fed. Cir. 2017) recognizing that "apparatus claims are not necessarily indefinite for using functional language", and *Microprocessor Enhancement Corp. v. Texas Instruments Inc. (MEC)*, 520 F.3d 1367, 1375 (Fed. Cir. 2008), have been overruled or are irrelevant. Those cases held that a claim to a "processor" programmed "for executing instructions" was proper form, and not per se indefinite.

***Eleventh Issue***

The Answer also misstates what the Appellant has argued in the Brief in this section.

What the Brief actually argued was that the format adopted for claim 1 – a processor programmed to perform a series of steps - is indeed proper form for a claim as recognized by both the Patent Office itself (see MPEP 2111.05 B(III)) and the CAFC (as opined in at least the *MasterMine* and *Microprocessor Enhancement* cases cited above) .

The Answer cites to *UltimatePointer, LLC v. Nintendo Co.*,118 USPQ2d 1125 (Fed. Cir. 2016) and *Rembrandt Data Techs., LP v. AOL, LLC,* 641 F.3d 1331,98 USPQ2d 1393 (Fed. Cir. 2011). for the supposed proposition that a 'hybrid claim' is improper. Neither case holds any such thing.

The mention of "hybrid" in *UItimatePointer* was in the context of an invention that used a particular type of device – a "hybrid direct/indirect pointing device". The word "hybrid" in that case was thus a

reference to a technical feature of the claimed invention, and not to particular the claim format used (indeed, the claim format was actually found to be proper).

*Rembrandt* was a case that involved determining the scope of a patent license. It too had nothing to do with considering whether a supposed "hybrid" claim format is proper.

***Conclusion***

In view of the foregoing, Appellant again respectfully requests the Board to reverse the rejections and pass this application to issue.

July 23 2020

Respectfully submitted,

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# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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:** | | | | |
| APPEAL FORWARDING FEE | 2413 | 1 | 1120 | 1120 |
| **Post-Allowance-and-Post-Issuance:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **1120** |

# Electronic Acknowledgement Receipt

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|---|---|
| **EFS ID:** | 40082504 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 23-JUL-2020 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 10:00:18 |
| **Application Type:** | Utility under 35 USC 111(a) |

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|---|---|---|---|---|---|
| 1 | Reply Brief Filed | 20200723_111054-0001U4C7_TPO_Reply_Brief.pdf | 188663<br>e2934d95c8f8d5aff14e288a79d2f60c8d2e0a2b | no | 15 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30652<br>81801fbc7fc21bf2ce9a81ab12b91d5d571fc9f2 | no | 2 |
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 07/29/2020

VLP Law Group LLP
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Palo Alto, CA 94301

| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 07/29/2020 | ELECTRONIC |

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patents@vlplawgroup.com

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JAMES ARTHUR PROCTOR JR. et al.

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Appeal 2020-005573
Application 15/271,410
Technology Center 3600

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# APPEAL DOCKETING NOTICE

The Patent Trial and Appeal Board received the appeal in the above-identified application from the Technology Center on July 27, 2020, and has assigned it the appeal number indicated above.

The recipient of this notice is reminded of its ongoing duty, within 20 days of any change during the proceeding, to update its mandatory notices to identify the real party-in-interest and each judicial or administrative proceeding that could affect, or be affected by, the Board proceeding. 37 C.F.R. § 41.8. For example, another docketed appeal in a related application may have the potential to affect, or be affected by, the Board proceeding.

In all future communications regarding this appeal, please include both the application number and the appeal number. Telephone inquiries can be made by calling 571-272-9797 and referencing the appeal number listed above. The mailing address for the Board is:

PATENT TRIAL and APPEAL BOARD
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ALEXANDRIA, VIRGINIA 22313-1450

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex Parte: James A. Proctor, Jr., et al.

Appeal No. 2020-005573 Confirmation No.: 7653

Application No.: 15/271,410 Examiner: Sherr, Cristina Owen

Application Filed: September 21, 2016 Art Unit: 3685

For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION DEVICES TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

# NOTICE UNDER 37 CFR §41.8

Appellant hereby updates the list of each judicial or administrative proceeding that could affect, or be affected by, the above-referenced Board proceeding.

A judicial proceeding in the United States District Court, Middle District of Florida, Orlando Division, entitled "Proxicom Wireless, LLC v. Macy's, Inc. and Macy's Florida Stores, LLC (No. 6:18-cv-64-Orl-37GJK), now concluded, involved several issued patents that claim priority to the same application involved in this appeal.

A judicial proceeding currently pending in the United States District Court, Middle District of Florida, Orlando Division entitled "Proxicom Wireless, LLC v. Target Corporation" (No. 6:19-cv-1886-RBD-LRH), involves several patents that claim priority to the same application involved in this appeal.

The following Requests for Inter Partes Review before the U.S. Patent and Trademark Office Trial and Appeal Board have now either been instituted or denied:

| IPR No. | Petitioner | App. No. | Patent No. | Respondent | Status |
|---|---|---|---|---|---|
| IPR2020-00903 | Target Corporation | 13/744457 | 9038129 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00904 | Target Corporation | 12364897 | 7936736 | Proxicom Wireless, LLC | Trial Instituted |

| | | | | | |
|---|---|---|---|---|---|
| IPR2020-00931 | Target Corporation | 12364828 | 8090359 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00932 | Target Corporation | 12364828 | 8090359 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00933 | Target Corporation | 13212766 | 8374592 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00934 | Target Corporation | 13212723 | 8385896 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00977 | Target Corporation | 13213028 | 8369842 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00978 | Target Corporation | 12364938 | 8116749 | Proxicom Wireless, LLC | Institution Denied |
| IPR2020-00979 | Target Corporation | 14472477 | 9161164 | Proxicom Wireless, LLC | Trial Instituted |
| IPR2020-00980 | Target Corporation | 12364819 | 8385913 | Proxicom Wireless, LLC | Trial Instituted |

Other than the proceedings listed above, there are no other prior or pending appeals, interferences, trials before the Board, or judicial proceedings (collectively, "related cases") which satisfy all of the following conditions: involve an application or patent owned by the appellant or assignee, are known to appellant, the appellant's legal representative, or assignee, and may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

January 19 2021

Respectfully submitted,

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# Electronic Acknowledgement Receipt

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|---|---|
| **EFS ID:** | 41676579 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 19-JAN-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 11:33:21 |
| **Application Type:** | Utility under 35 USC 111(a) |

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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Miscellaneous Incoming Letter | 20210119_111054-0001U4C7_TPO_Notice_Under_37CFR_41_8.pdf | 96327<br>3d49213d96eb2d9a0a24d56c11b209482e6c1110 | no | 2 |

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**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.**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 08/17/2021

VLP Law Group LLP
555 Bryant Street
Suite 820
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| EXAMINER | |
|---|---|
| SHERR, MARIA CRISTI OWEN | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 08/17/2021 | ELECTRONIC |

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Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

*Ex parte* JAMES ARTHUR PROCTOR JR. and
JAMES ARTHUR PROCTOR III

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Appeal 2020–005573
Application 15/271,410
Technology Center 3600

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Before CARL W. WHITEHEAD JR., ERIC S. FRAHM and
IRVIN E. BRANCH, *Administrative Patent Judges*.

WHITEHEAD JR., *Administrative Patent Judge*.

## DECISION ON APPEAL

## STATEMENT OF THE CASE[1]

Appellant[2] is appealing the final rejection of claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60 under 35 U.S.C. § 134(a). *See* Appeal Brief

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[1] Rather than reiterate Appellant's arguments and the Examiner's determinations, we refer to the Appeal Brief (filed April 27, 2020), the Reply Brief (filed July 23, 2020), the Final Action (mailed January 22, 2020) and the Answer (mailed June 10, 2020), for the respective details.

[2] Appellant refers to "applicant" as defined in 37 C.F.R. 1.42(a). ("The word 'applicant' when used in this title refers to the inventor or all of the joint inventors, or to the person applying for a patent as provided in §§ **1.43**, **1.45**, or **1.46**."). Appellant identifies Proxicom Wireless, LLC as

8. Claims 1 and 31 are independent. Claims 3, 5–7, 9–11, 14, 16, 18–30, 32–34 and 36–40 are canceled; claim 43 is withdrawn. *See* Claims Appendix. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

*Introduction*

According to Appellant, "The present invention is generally concerned with facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other utilizing both a short range and a long range wireless capability." Specification 4.

*Independent Claims*

1. A mobile wireless device comprising:

a first radio;

a second radio;

one or more processors;

one or more non-transitory memory devices coupled to the one or more processors, the one or more non-transitory memory devices storing a set of instructions that when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers;

receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions when the device is

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the real party in interest. Appeal Brief 4.

located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier, and a proximity beacon service identifier (PBSI);

determining if a particular short range transmission of the plurality of short range transmissions a) includes a MAC address, and b) includes the proximity beacon service identifier (PBSI) and if c) the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service;

then:

determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier.

31. A method for facilitating use of proximity beacons, the method executing within a mobile device, and the method comprising:

communicating between the mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;

receiving, at the mobile device using a second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions from one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier (UID), and a proximity beacon service identifier (PBSI);

a) determining that a particular short range transmission of the plurality of short range transmissions includes a MAC address,

b) determining that the proximity beacon service identifier (PBSI) is present, and

c) determining that the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service; and

when the three determining steps a) b) and c) are each true, then d) determining that an entity or object associated with the proximity beacon service is within proximity to the mobile device, by utilizing the identifier related information and the unique identifier.

*Rejections on Appeal*[3]

Claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Final Action 3–4.

Claims 13, 44–46, 50 and 57 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Final Action 4–5.

Claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Final Action 6–7.

Claim 13 stands rejected under 35 U.S.C. § 112, second paragraph, as

[3] The Examiner incorrectly list claim 5 as being rejected however claim 5, as noted above, was canceled. We view this as harmless error. The Examiner withdraws the 35 U.S.C. § 112, second paragraph of claim 17 for lack of antecedent basis. *See* Answer 3.

being incomplete for omitting essential steps, such omission amounting to a gap between the steps. Final Action 7.

## ANALYSIS[4]

Claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60 – written description rejection

The Examiner determines that the Specification fails to provide written support for the first and second radio limitations recited both in independent claims 1 and 31. Specification 3–4. Appellant contends that there is support for the radio limitations in paragraphs 39 and 43 of the US Patent Publication 2017/0011425 A1 of the instant application which coincides with pages 9 and 11 of the Specification. Appeal Brief 12–13.

We find Appellant's argument persuasive of Examiner error because the Specification discloses, referring to Figure 1, "The cellular network is connected to devices 106 and 108 by wide area wireless links 104 and 103" (Specification 9), and "a given device 106, 108 uses a short range wireless link 107 such as a Bluetooth (IEEE802.15.l) or Wi-Fi (IEEE802.1l) link to detect the presence of other devices such as device 108" (Specification 11). Further, Appellant readily admits that "Most mobile phones on the market today support at least two wireless standards; one for the cellular wireless wide area network connection (WWAN) and one for a wireless personal or local area network (WPAN, WLAN)." Specification 3. We agree with Appellant that the Specification provides sufficient support for the disputed

[4] Appellant and Examiner refer to the paragraphs of US Patent Publication 2017/0011425 A1 of the instant application. We make note of this and refer to the corresponding pages of the Specification of the instant application for clarity.

claim limitations because we find the Specification discloses multiple wireless standards employed in communicating via radio waves. *See* Specification 11. We further find Appellant's argument that the Examiner fails to provide adequate reasoning for the rejection by explaining why the Specification was not sufficient to support the disputed claim limitations persuasive of Examiner error. *See* Appeal Brief 10; Final Action 3–4. We find Appellant's arguments persuasive of Examiner error in regard to claims 1 and 31 written description rejection. Accordingly, we reverse the Examiner written description rejection of independent claims 1 and 31, as well as, dependent claims 2, 4, 8, 12, 13, 15, 17, 35, 41, 42 and 44–60.

The Examiner further determines that the Specification does not support non-transitory memory devices recited in independent claims 1 and 31. *See* Final Action 4; Answer 4–5. Appellant contends, "Claim 31 is a method claim and does not actually recite any 'memory device'. For this reason alone, the rejection of at least claim 31 is *prima facie* deficient as a matter of law." Appeal Brief 14. Appellant's argument is persuasive of Examiner error in regard to claim 31 written description rejection because claim 31 does not recite non-transitory memory devices as claim 1 does. Accordingly, we reverse the Examiner's written description rejection of claim 31, as well as, dependent claims 35, 41, 42, 44–57 and 60.

In regard to claim 1, the Specification discloses, "Memory provides volatile storage for computer software instructions and data used to implement an embodiment of the present invention (e.g., applications programs and the like). Disk storage can provide non-volatile storage for computer software instructions and data used to implement an embodiment of the present invention." Specification 10 (emphasis added). Appellant

argues that "The words 'non-transitory' and 'non-volatile' mean the same thing in English, and to one of skill in the art." Specification 15; *see* Declaration ¶ 97 ("Such a person would have, therefore, understood the use of the word 'non-transitory' in claim 1 to mean the same thing as 'non-volatile' as stated in the specification.").

Here, Appellant's arguments are not persuasive of Examiner error in regard to the written description rejection of claim 1. The Declaration states that an artisan at the time the invention was made "would have understood paragraph [0042] to mean that computer programs may be stored on a variety of non-volatile, non-transitory computer readable media, and that these would have included DVD ROMs, CD-ROMs, diskettes, tapes, and other non-volatile media." Declaration ¶ 99. We do not agree with Appellant's position that the terms non-volatile and non-transitory mean the same because not all non-volatile storage is non-transitory. For example, rewritable CDs and DVDs, as well as, rewritable hard drives are not considered to be volatile, however because data stored on them can be rewritten, that means they are transitory. Accordingly, we sustain the Examiner's written description rejection of claim 1, as well as, claims 2, 4, 8, 12, 13, 15, 17, 58 and 59.

Claims 13, 44–46, 50 and 57 – written description rejection

In regard to claim 13, the Examiner determines, "The Specification does not support performing down loading application software in response to sending the unique identifier to the server. (See PgPub US 2017/0011425 at para. 99)." Final Action 4; *see* Specification 32–33.

However, the Specification discloses:

> For instance, an account associated with one or more identifiers may belong to a museum. As a museum patron walks to an exhibit, the patron's device 202 will receive an identifier sent from museum broadcast device 204 operated by the museum. The patron device 202 passes the identifier or museum device 204 to the central server 100, which in-turn recognizes it as being associated with that exhibit within that museum and passes relevant information back to the user's device 202. A distinguishing feature of this approach relative to prior art is that the patron device 202 in this example may move out of proximity of broadcast device 204, yet continue to view the content being provided by the server 100 related to the detected broadcast device 204. Content may include text, pictures, web pages, application software such as games, informative display applications, or other content such as audio or video to be offered to the user's device as well.

Specification 12 (emphasis added).

Appellant argues, the Examiner only initially refers paragraph 99 (Specification 32–33) "without any reference to any other part of the specification, or providing any reason." Appeal Brief 16; *see* Final Action 4. Appellant contends, "paragraph [0046] specifically provides an example where an application is 'downloaded' after the 'unique identifier' is sent to the server." Appeal Brief 16 (citing Specification 12). We find Appellant's argument is persuasive of Examiner error because the Specification provides support for downloading application software as recited in claim 13. Accordingly, we reverse the Examiner's written description rejection of claim 13.

In regard to claims 45 and 50 which depend upon independent claims 1 and 31 respectively, the Examiner determines that the Specification does not provide support for the limitation "sending the unique identifier, using

the first radio, to at least one server of the one or more servers, and receiving further information relating to an object or entity associated with being within proximity to the mobile device" in context with the independent claims. Final Action 4–5 (citing paragraph 111, Specification 33). Appellant contends that support for the claims is found in Figures 1 and 4–7, as well as, paragraph 61 (Specification 18). *See* Appeal Brief 16–21; Reply Brief 7–11. The Examiner does not explain in the Final Action why the Figures and the Specification are deficient. *See* Final Action 4–5. The Examiner provides an explanation of why the Specification and Figure 7 are considered to be deficient in the Answer, however we find Appellant's contention is persuasive of Examiner error because the Specification, as well as the Figures, provide support for the disputed claim limitations. *See* Answer 6–8. Accordingly, we reverse the Examiner's written description rejection of claims 45 and 50.

In regard to dependent claims 44 and 46, the Examiner determines, "The Specification does not support both receiving identifier related information from the server as recited in claims 1 and 31, and preventing the sending of the unique identifier to the servers as recited in claims 44 and 46. (See PgPub US 2017/0011425 at para. 111)." Final Action 5 (citing Specification 33). Appellant contends the Specification provides support for the claims in paragraphs 47 and 48. *See* Appeal Brief 22–23. Appellant's argument is persuasive of Examiner error because the Specification discloses, "The idealized effect of the action function would be to reduce the number of requests to the server by not re-requesting recently requested identifiers which have already been passed to the server, for some period of

time." Specification 33. Accordingly, we reverse the Examiner's written description rejection of claims 44 and 46.

In regard to claim 57, the Examiner determines, "The Specification does not support the steps of 'retrieving a stored user email' and 'sending an Email ... based upon the stored proximity user behavior'. (See PgPub US 2017/001425 at para. 67)." Final Action 5 (citing Specification 23). Appellant contends that support for the claim is provided by the Specification. Appeal Brief 23–24. The Specification discloses:

> Finally, the transaction details may be stored by the server, or sent to a thirdly party server for tracking spending habits of that account holder, or customers of that merchant allowing the merchant to track that specific customer's behavior and cater to them in the future with various specials delivered via email, or during their next visit via their device in the form of an electronic coupon. This process can be performed with a goal to help the merchant expose the customer to other products or services the merchant believes the customer might find desirable.

Specification 23 (emphasis added).

Appellant contends, "One of skill in the art inherently understands, without further explanation, that in order for the server to send an email to that user account, it must have previously stored the associated email address. Otherwise, the server would not know where to send the customized content." Appeal Brief 24. The Examiner does not provide an explanation for why claim 57 is not supported by the Specification in the Final Action. *See* Final Action 5. Further, we do not agree with the Examiner's response or position in the Answer that paragraph 67 is deficient. *See* Answer 8. Appellant's contention is persuasive of Examiner error and, accordingly, we reverse the Examiner's written description rejection of claim 57.

Claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60 – indefiniteness rejection

The Examiner determines that:

> The terms "respective MAC Address", "respective unique identifier" and "determining . . . is in proximity" in claims 1 and 31 are relative terms which render the claim indefinite. The terms "respective" and "proximity" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Final Action 6.

Appellant contends, "While a conclusion is reached that the words 'respective' and 'proximity' are 'relative terms', no analysis of the claim language, nor any attempt to interpret these terms in light of the specification has been made. Nor is any reasons why they are supposedly 'relative' is given." Appeal Brief 27. Appellant's contention is persuasive of Examiner error. We are not persuaded that the claims are indefinite merely because terms are broad or that the terms might be relative terms because the scope of the claimed subject matter is clearly defined. *See* M.P.E.P. §§ 2173.04, 2173.05(b).[5] Accordingly,

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[5] A broad claim is not indefinite merely because it encompasses a wide scope of subject matter provided the scope is clearly defined. M.P.E.P. § 2173.04.

The use of relative terminology in claim language, including terms of degree, does not automatically render the claim indefinite under **35 U.S.C. 112(b)** or **pre-AIA 35 U.S.C. 112**, second paragraph. *Seattle Box Co., Inc. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, in light of the specification. M.P.E.P. § 2173.05(b).

we reverse the Examiner's indefiniteness rejection of claims 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42 and 44–60.

In regard to claim 1, the Examiner determines that, "A single claim which purports to be both a product or machine and a process is ambiguous and is properly rejected under 35 USC 112, second paragraph, for failing to particularly point out and distinctly claim the invention." Final Action 7. The Examiner determines that "claim 1 is directed to a 'mobile wireless device' and further recites 'receiving . . .when the device is located within a detection range…", rendering the claim ambiguous. Final Action 8.

Appellant argues that the Examiner's determination is in error because the claim is in a permissible format. *See* Appeal Brief 34–36. Appellant's argument is persuasive of Examiner error because the claim "merely use[s] permissible function language to describe the capabilit[y] of the claimed [device]" and is therefore distinguish from a claim that claims "both an apparatus and a method of using the apparatus within a single claim [that makes] it 'unclear whether infringement ... occurs when one creates a[n infringing] system, or whether infringement occurs when the user actually uses [the system in an infringing manner]." *Mastermine Software, Inc. v. Microsoft Corp.,* 874 F.3d 1307, 1316 (Fed. Cir. 2017); *see* M.P.E.P. § 2173.05(p) II; *see also* Appeal Brief 34. We reverse the Examiner's indefinite rejection of claim 1.

In regard to claim 13, the Examiner determines, "Claim 13 recites that 'downloading' is performed 'in reaction to sending of the unique identifier,' but claim 1 does not include a step of sending the unique identifier to the server" and therefore claim 13 is incomplete for omitting essential steps.

Final Action 7; *see* M.P.E.P. § 2172.01.[6] Appellant contends, "the claimed steps involve first sending the unique identifier from the mobile wireless device to the server. Then, and only then, in response to having performed that sending step, is the step of 'downloading the application software' performed." Appeal Brief 33. Appellant argues that, "The claim is simply specifying an order in which the operations are performed for the claimed embodiment. There is nothing ambiguous or indefinite at all." Appeal Brief 33. Appellant argument is persuasive of Examiner error. Accordingly, we reverse the Examiner's indefiniteness rejection of claim 13.

CONCLUSION

| Claims Rejected | 35 U.S.C. § | Reference(s)/Basis | Affirmed | Reversed |
|---|---|---|---|---|
| 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42, 44–60 | 112 | Written description | 1, 2, 4, 8, 12, 13, 15, 17, 58, 59 | 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42, 44–60 |
| 13, 44–46, 50, 57 | 112 | Written description | | 13, 44–46, 50, 57 |
| 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, 41, 42, 44–60 | 112 | indefiniteness | | 1, 2, 4, 8, 12, 13, 15, 17, 31, 35, |

[6] Depending on the specific facts at issue, a claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected . . . under **35 U.S.C. 112(b)** or **pre-AIA 35 U.S.C. 112**, second paragraph, as indefinite (see, e.g., *In re Venezia,* 530 F.2d 956, 189 USPQ 149 (CCPA 1976)). M.P.E.P. § 2172.01.

| | | | | |
|---|---|---|---|---|
| | | | | 41, 42, 44–60 |
| 13 | 112 | indefiniteness | | 13 |
| **Overall Outcome** | | | 1, 2, 4, 8, 12, 13, 15, 17, 58, 59 | 31, 35, 41, 42, 44–57, 60 |

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1). *See* 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED-IN-PART

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| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
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| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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| | 36 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00904, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
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| | 38 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 39 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00933, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 40 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00934, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 41 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00977, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 42 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00978, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 43 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00979, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 44 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00980, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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|---|---|---|---|
| | 45 | Thongthammachart, S., et al., "Bluetooth enables in-door mobile location services," In Proceedings of the 57th IEEE Semiannual Vehicular Technology Conference: VTC2003 (Vol. 3, pp. Session 8H, paper 3) IEEE. | |
| | 46 | Transaction Receipt; PACER Service Center, dated August 6, 2020, pp. 1-3 | |
| | 47 | Transcript of Telephonic Motion Hearing, dated June 3, 2020; United States District Court, Middle District of Florida, Orlando Division; pp. 1-41; Case No. IPR2020-00903; Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 5:19-cv-1886-RBD-LRH; pp. 1-41 | |
| | 48 | Using Blouetooth, MC909X User Guide, Symbol Technologies, Inc., pp. 1-66 (2005) | |
| | 49 | Using MC9094 Phone, MC909X User Guide, Symbol Technologies, Inc., pp. 1-20 (2005) | |
| | 50 | Wang, F., et al., "Bridging Physical and Virtual Worlds: Complex Event Processing for RFID Data Streams," University of California, Los Angeles Computer Science Department, Springer-Verlag Berlin Heidelberg 2006, pp. 588-607 | |

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

## CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

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## SIGNATURE

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| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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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.

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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)).

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|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
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| | Application Number | 15271410 |
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| | First Named Inventor | James Arthur Proctor |
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| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | | |
|---|---|---|---|
| | 1 | Want, R., et al., "Bridging Physical and Virtual Worlds with Electronic Tags," Xerox PARC, CHI '99 15-20 May 1999, PP- 370-377 | |
| | 2 | WaveWorks Portable Shopping System Integration Guide, Integration Services Group, Pittsburgh, Pennsylvania, pp. 1-185 | |
| | 3 | Wei, G., et al., "HiPEC: A Hybrid P2P Model for Electronic Commerce," Zhejiang Gongshang University College of Computer & Information Engineering, pp 1-5 (2008) | |
| | 4 | Yang, H., et al., "Indoor Localization Systems - Tracking objects and personnel with sensors, wireless networks and RFID," Measurement+ Control, Vol. 42/1, Feb. 2009, pp. 18-23 | |
| | 5 | Zhang, Y., et al., "Progress in WWW Research and Development," 10th Asia-PacificWeb Conference, APWeb 2008, Shenyang, China, April 26-28, 2008 Proceedings, pp. 331-341 | |
| | 6 | Zhou, Y., et al., "A Map Registration Localization Approach based on Mobile Beacons for Wireless Sensor Networks," Communications Research Centre Canada, 2011 Crown, 5 pp. | |

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| Attorney Docket Number | 111054-0001U4C7 |

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| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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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)).

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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.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Angela Wendel |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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:** | | | | |
| **Extension-of-Time:** | | | | |

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| **Miscellaneous:** | | | | |
| SUBMISSION- INFORMATION DISCLOSURE STMT | 2806 | 1 | 130 | 130 |
| | | **Total in USD ($)** | | **130** |

# Electronic Acknowledgement Receipt

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|---|---|
| **EFS ID:** | 43576177 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 23-AUG-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 16:27:24 |
| **Application Type:** | Utility under 35 USC 111(a) |

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| Submitted with Payment | yes |
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| Payment was successfully received in RAM | $130 |
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| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
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| 1 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_1.pdf | 1049266<br>8e2e7fa6fa92bb2cbc317ca113d5dd3c119f04c5 | no | 21 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_2.pdf | 1046461<br>0298b866cd0c2b9794817150c17e521edb5212b2 | no | 8 |
| **Warnings:** | | | | | |
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| 3 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_3.pdf | 1045611<br>979784b7f36d4b1aa88740536e0c19090ec55a00 | no | 8 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_4.pdf | 1044096<br>91898da2dde76d891b36493914f28924abf6033f | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Non Patent Literature | 100_Pages_from_1681_919864.pdf | 1891596<br>9be97bd4f07f54c91b910c532ae2f21d3034d65a | no | 50 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Non Patent Literature | 101_2020_904_Proxic_919873.pdf | 437177<br>560d4ade7a172cac17a42c69e2b9c95d4b8c2a0f | no | 43 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

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| 7 | Non Patent Literature | 102_IPR202000931Pro_919880.pdf | 403549<br>ea14000eff6cd0e61a3ccd3fff4d8dbd7211cab0 | no | 48 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Non Patent Literature | 103_Pages_from_1681_919887.pdf | 1767431<br>3017ee0ef6436cbbb57bee9fcb134b16b28214cc | no | 46 |
| **Warnings:** | | | | | |
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| **Warnings:** | | | | | |
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| 10 | Non Patent Literature | 105_zvcsvsdvs_919821.pdf | 4804315<br>2e164ce14ef4173b5b0623e2ae4d6ad591c20958 | no | 49 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
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| **Warnings:** | | | | | |
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| **Information:** | | | | | |
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| **Warnings:** | | | | | |
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| **Warnings:** | | | | | |
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| 18 | Non Patent Literature | 112_Pages_from_1681_919933.pdf | 16471023<br>cd5166bc4ea3e5af47c4f1f9fff9aa439db69e3a | no | 138 |
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| 19 | Non Patent Literature | 113_Pages_from_1681_919936.pdf | 3224986<br>3e7b01ef5b0d7878ce13ef5070eb778cc726db17 | no | 63 |
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**National Stage of an International Application under 35 U.S.C. 371**

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**New International Application Filed with the USPTO as a Receiving Office**

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# Electronic Acknowledgement Receipt

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| **EFS ID:** | 43576493 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 23-AUG-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 16:32:40 |
| **Application Type:** | Utility under 35 USC 111(a) |

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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
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| 56 | Non Patent Literature | 41_Pages_from_1681_919850.pdf | 1904392<br>b034cfe45193dcda7eccd486934103db0db3acab | no | 22 |
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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.**

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## Abstract

A uniform resource locator of an information resource or a plurality of hypertex t links for information resources on a network is obtained using a scanner code. S canner code data is received from a user. A database correlating the scanner code data with the uniform resource locator or resource addresses are queried. The uniform resource locator or resource addresses corresponding to the scanner code data are provide d to the user.

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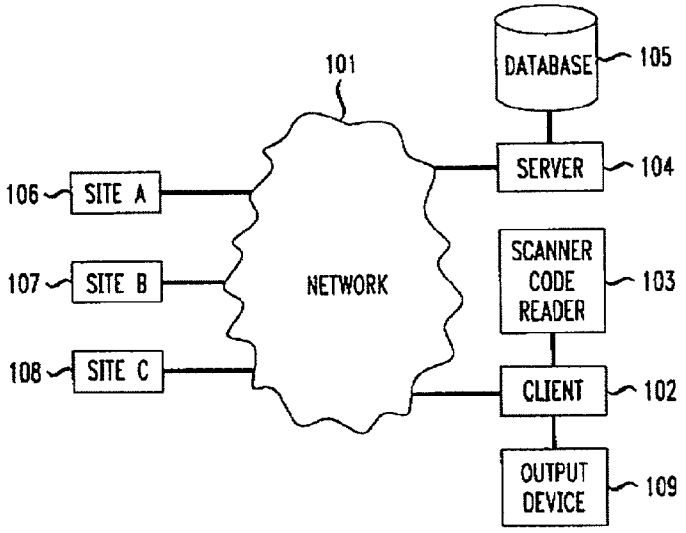
(54) **MOTEUR DE RECHERCHE DE RESEAU UTILISANT DES CODES DE BALAYAGE**

(54) **NETWORK-BASED SEARCH ENGINE USING SCANNER CODES**




(57) Un localisateur de ressources d'information uniformes ou une pluralité de liaisons hypertexte associées à des ressources d'information, ces ressources étant accessibles par l'intermédiaire d'un réseau, est obtenu au moyen d'un code de balayage. Les données d'un code de balayage sont reçues d'un utilisateur. Une base de données permettant de corréler les données du code de balayage avec le localisateur de ressources uniformes ou les adresses des ressources est consultée. Le localisateur de ressources uniformes ou les adresses des ressources qui correspondent aux données du code de balayage sont alors fournies à l'utilisateur.

(57) A uniform resource locator of an information resource or a plurality of hypertext links for information resources on a network is obtained using a scanner code. Scanner code data is received from a user. A database correlating the scanner code data with the uniform resource locator or resource addresses are queried. The uniform resource locator or resource addresses corresponding to the scanner code data are provided to the user.

Industrie Canada Industry Canada

# NETWORK-BASED SEARCH ENGINE USING SCANNER CODES


## ABSTRACT OF THE DISCLOSURE

A uniform resource locator of an information resource or a plurality of hypertext links for information resources on a network is obtained using a scanner code. Scanner code data is received from a user. A database correlating the scanner code data with the uniform resource locator or resource addresses are queried. The uniform resource locator or resource addresses corresponding to the scanner code data are provided to the user.

# NETWORK-BASED SEARCH ENGINE USING SCANNER CODES

## FIELD OF INVENTION

The present invention relates to a search engine for locating the resource addresses of information resources on a network. Specifically, the present invention relates to using a scanner code associated with a particular product or service to locate the resource addresses of information resources that pertain to that product or service and are stored on the network.

## BACKGROUND OF THE INVENTION

Finding information resources distributed across a network with a large number of nodes and many resources can be problematic. For example, the World Wide Web on the Internet is a network on which it is difficult to find information resources responsive to a particular need in part because of its large size. The World Wide Web comprises information resources stored in collections known as Web sites. Each Web site generally stores information in accordance with a theme. For example, one Web site stores information about the Baltimore Orioles, including their current roster and game schedule. Another Web site stores information about Museum of Modern Art in New York City, including samples from its collection and its hours of operation. It can be seen from these two examples, Web sites store information on a very wide variety. Due to the size and extent of the World Wide Web, however, finding these information resources can be difficult.

Known methods for finding resources on the World Wide Web include search engines. Examples of known search engines include Altavista <http://altavista.digital.com.>, Infoseek <http://www.infoseek.com> and Lycos <http://www.lycos.com>. These known search engines scan the information resources of the World Wide Web, download selected data, and then correlate the selected data with its resource address within a database record. The selected data can further be cross correlated with other selected data and resource addresses that are related to each other in some way. This correlated information is stored in a database which is generally a proprietary search engine that has gathered and correlated the information.

To find an information resource on the World Wide Web, a user types on a keyboard a keyword search to a search engine. In response to the user keyword search request, known search engines search their databases for resource addresses that relate to the keyword. These resource addresses are then presented to the user, often along with summary information. The user browses and selects information resources based upon their apparent responsiveness to the user's needs.

For example, a keyword search based on a particular brand of soap submitted to known search engines could result in as many as 100,000 information resources matching the query, far too many for any user to comprehensively review. Known search engines attempt to ameliorate this problem by prioritizing these results and presenting the best results matches first. An example of a known prioritizing method is to present resource addresses for which the keyword occurs more frequently to the user.

The known search engines can present resource addresses for which the keyword occurs less frequently in later pages presented to the user.

The accuracy of known search methods can be poor. These so-called "best matches" may not relate to the particular brand of soap per se. Rather, the information resources produced by the search may relate to completely unrelated products, such as a particular soap opera or a particular soap opera publication. For a user seeking information on the particular brand of soap, these search results are non-responsive. With sufficient guesswork or luck, a user may be able to formulate a search request that accurately returns the resource addresses of information resources precisely responsive to the user's needs. The user, however, is generally unable to effectively formulate a search request that yields the desired information for a particular product or service.

A better way is needed for the user to submit a search request for information resources on a network and to obtain reliably and accurately the addresses of information resources precisely responsive to the user's needs.

Another known method for retrieving stored information involves submitting scanner code data to a computer processing unit (CPU). See U.S. Patent 5,463,209 issued to Figh et al. on October 31, 1995. Scanner code data is derived from a graphical scanner code of the type shown in FIG. 3. The scanner code shown in FIG. 3 is a Universal Product Code (UPC). A unique UPC is placed on the packaging of a product.

The product is scanned at a vending machine, including a scanner, by a

customer. The vending machine sends scanner code data derived from the scanned UPC to the CPU connected to a database. The CPU converts the scanner code data to a memory address within the connected database. The database stores product information correlated to the UPC of the product. Product information includes such characteristics as product name and price. Product name and price are sent back to the vending machine. At the cashier terminal, the product information is displayed to the cashier and the customer purchasing the product. The pricing information is used to calculate the amount owed by the customer. The pricing and the product information is used to create a record of the transaction in the form of a receipt.

In this known system, scanner code data is used to retrieve contents of an information resource comprising a single database. The contents of the needed information resource are at a known location, i.e., the only database. This system, while it carries out finding function, would be unsuitable for the purpose of determining the location of an information resource on a large network storing a multitude of information resources at different locations.

U.S. Patent 5,594,226, issued to Steger on September 5, 1995, is another known system for obtaining information from a network using scanner codes. The Steger system uses the bar code printed on a check, traveler's check or money order. The bar code is scanned to obtain scanner code data. A database is then consulted to determine the identity of the appropriate bank, traveler check company or money order company, which is then automatically contacted. A request for account status information is then

sent to the selected financial institution. The status information is sent to the user who provided the scanned data; generally the user is a merchant. The database in the Steger system is connected to a switch capable of switching an electronic transaction from one computer on a network to another. When the switch receives the scanner code data, the database causes the switch to automatically connect the sender to the appropriate financial institution. Data from the bank is then sent to the merchant who scanned the bar code. Here, as in other known systems, the scanner code is used to obtain the content of an information resource on a network, not the address of an information resource on the network.

The known systems all suffer from several shortcomings. First, known systems use scanner codes to obtain the content of information resources that are stored on a network. None of these known methods, however, are directed toward providing a user with the addresses of network information resources pertaining to the scanner code which is input by the user. Returning content disadvantageously precludes the user from selecting among the information available regarding the product of service corresponding to the scanner code. In other words, once the user has submitted the scanner code data to the system, the system returns a fixed, pre-arranged set of information to the user. A more advantageous system would allow the user to pick and choose which information is delivered to the user regarding a product or service corresponding to a scanner code.

Second, another shortfall of known systems that use scanner codes to locate

information on the network is that none operate as a finding tool for such information on the Internet. A more advantageous system would use scanner code data provided by a user to provide the Uniform Resource Locator (URL) of an Internet resource to the user. The user would then be able to fetch the information resource located at the URL provided by the system.

## SUMMARY

The present invention uses the unique information contained within a scanner code associated with a particular product or service to obtain at least one address of an information resource on a network pertaining to that product or service. The present invention can advantageously enable the user to select from the resource addresses which information resources pertaining to a product or service are to be delivered to the user. This enables the user to advantageously tailor the information with which the user is provided in response to inputting scanner code data. Similarly, the present invention advantageously enables a product manufacturer or information provider to select which information resource addresses are correlated with each particular scanner code associated with a particular product or service.

The present invention also returns a URL of an information resource on the Internet in response to scanned data input by a user. In one embodiment, the present invention also advantageously returns a group of related URLs in response to the scanner code data input by a user.

In accordance with the present invention, scanner code data is received from a user. In one embodiment of the present invention, the user has purchased a product that has a Universal Product Code (UPC) which the user scans using an electronic scanner connected to the user's computer. In another embodiment, the user scans a Stock-Keeping Unit (SKU) affixed to an article in the process of manufacture, or at a retail outlet.

In accordance with the present invention, the scanner code is used to query a database containing records that correlate scanner code data with resource addresses of information resources on a network. In one embodiment of the present invention, scanner code data are correlated with the resource address of an information resource by pre-arrangement. For example, a manufacturer of a particular product places information resources regarding a specific product on a network at particular addresses. The manufacturer then registers these resource addresses and the corresponding UPC scanner code that appears on the product. The resource addresses correlated with the UPC scanner code data are stored in a database.

In another embodiment of the present invention, the network is searched for information resources relating to products known to have associated scanner code data. The addresses of information resources are correlated with at least one relevant scanner code and stored in a database.

When a user provides scanner code data to a server in accordance with the present invention, the server returns to the user the resource addresses correlated to the

scanner code data in the database.

In yet another embodiment of the present invention, information that is closely related to the product or service corresponding to scanner code data is presented to the user. This information is known beforehand to be closely related to the product or service; consequently, multiple information resource addresses can be associated with the scanner code of the particular product or service, within a database correlating the scanner codes with the address of information resources. For example, a manufacturer can register multiple information resource addresses with a particular scanner code. In such a case, for example, a user providing scanner code data from a can of lentil soup made by a particular company is provided with the resource address of an information resource on the network that pertains precisely to lentil soup made by that manufacturer; the user is also provided with additional addresses for similar soups made by other manufacturers. Alternatively, if a user provides scanner code data for which there is no directly correlated network information resource, the user is advantageously provided with resource addresses of closely related products.

The resource addresses of information resources corresponding to scanner code data provided by the user are advantageously displayed to the user in an easy-to-u se graphical user interface. In one embodiment the resource addresses presented to the user are hypertext links. When any hypertext link is selected by the user, the information resource at that address is promptly displayed.

The search results are provided to the user through an output device. The output

device can be a video monitor, a printer and/or an audio speaker. A video monitor is advantageously used as an output device, when the information resources are embodied as hypertext pages in Web sites on the World Wide Web. Such hypertext pages are often best viewed using the video monitor. A printer is advantageously used as the output device when obtaining forms, manuals and bulletins which are meant to be posted. An audio speaker is advantageously used as an output device to provide music and spoken information. These devices may be advantageously combined to provide multi-media information to the user. For example, the video monitor can be used with the audio speaker to provide a video and audio information to the user. A printer device can also be used to provide printed coupons relating to the specific product corresponding to the scanner code data provided by the user.

Scanner code data can be obtained from an optical scanner, a keyboard, a mouse or a microphone. For example, an optical scanner can be used to scan a UPC or SKU code affixed to a product. A keyboard can be used to input the decimal digits that accompany a UPC Code. A mouse may be used to select a particular UPC Code from a set of UPC codes presented to the user on the display. A microphone can be used to receive a spoken version of the decimal digits accompanying a UPC code. Voice recognition software can translate these digits into digital signals which are then provided as scanner code data in accordance with the present invention.

The scanner code can have information coded in one dimension of the scanner code or can have information coded in two dimensions of the scanner code. Examples

of one dimensional scanner codes include: the Universal Product Code, Uniform Product Numbers, Stock Keeping Unit, International Standard Book Number and International Article Number. The two dimensional scanner code can be one of any number of standards, including Code 49 scanner code introduced by the Intermec Corporation in 1988.

In another embodiment of the present invention, the scanner code data can be directly related to the network address. A database can be queried to provide supplemental information. The network address can be constructed from the scanner code data and the supplemental information.

In another embodiment of the present invention, scanner code data can be used to establish a connection between a calling party and a called party. The connection can be established over a data network. The scanner code data is used to query a database to obtain the called party's network address. The network address to provided to the calling party. Alternatively, the connection can be established over a telephone network. The scanner code data is used to query a database to obtain the called party's telephone number. The calling party's telephone number and the called party's telephone number are provided to the telephone network to establish the call.

The present invention advantageously provides a way for the user to find information resources on a network using widely available scanner codes associated with products and services. In accordance with the present invention, only information resources that precisely correspond to a given scanner code and/or information that is

known beforehand to be very closely related thereto is provided to a user when the user provides scanner code data to the present invention. The present invention advantageously allows the user to conveniently find information pertaining directly to a specific product or service. The present invention further advantageously allows the user to pick and choose among the information resources available on a network corresponding to a given scanner code. This advantageously renders the experience of finding information resources using a scanner code in an interactive process whereby the user participates in determining precisely which information regarding a product the user retrieves. The present invention advantageously scales well, performing at the same high level of efficiency regardless of how many information resources (either related or unrelated to a product whose scanner code data is stored in the database of the present invention) are added to the network.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a system block diagram of a communication network according to an embodiment of the present invention.

FIG. 2 shows a graphical user interface that can display the search results to a user according to an embodiment of the present invention.

FIG. 3 illustrates an example of a UPC code.

FIG. 4 shows a graphical user interface that can display the search results to a user according to an embodiment of the present invention.

FIG. 5 shows a system block diagram of a communication network according to another embodiment of the present invention.

FIG. 6 is a flowchart illustrating a method for obtaining a network address where the scanner code data is directly related to the network address, according to this embodiment of the present invention.

FIG. 7 shows a system block diagram of a communication network according to another embodiment of the present invention.

FIG. 8 is a flowchart that illustrates a method for establishing telephone calls over the communications network according to an embodiment of the present invention.

FIG. 9 illustrates a communications system that allows a calling party to initiate a telephone call a telephone network based on scanner code data, according to an embodiment of the present invention.

FIG. 10 is a flowchart illustrating a method for placing a call over the telephone network based on scanner code data, according to an embodiment of the present invention.

DETAILED DESCRIPTION

A system block diagram of a communication network according to an embodiment of the present invention is shown in FIG. 1. Network 101 interconnects a client computer 102 connected to a scanner code-reader 103; a server 104 connected to

a data-base 105; and sites A 106, B 107, and C 108.

Sites A 106, B 107, and C 108 are network nodes that store information resources. Each of the information resources stored on sites 106, 107 and 108 has a corresponding resource address. An example of a resource address is a URL. As used herein, the term "resource address" means any designation sufficient for establishing the location of an information resource on a network. Another example of network 101 is a corporate intranet. An example of site A 106, site B 107 and site C 108 are Web sites on the World Wide Web. Another embodiment of sites A 106, B 107, and C 108 are servers on a corporate intranet that store a proprietary information resources.

In accordance with the present invention, the user provides scanner code data to client computer 102. Client computer 102 comprises a processor, computer readable memory, an input port to be coupled to an input device such as scanner code reader 103 in FIG. 1, an output port to be coupled to output device 109 such as a video monitor, printer, and/or speaker, and a network port to be coupled to network 101. The client computer also comprises a data-bus that interconnects the processor, computer-readable memory, input port, output port and network port.

A server 104 comprises processor, computer-readable memory, a database port to be coupled to database 105, and a network port to be coupled to network 101. The server 104 also comprises a data bus that interconnects the processor, computer readable memory, database port, and network port. Database 105 comprises computer readable memory that is accessed by server 104. Database 105 stores scanner code data

correlated with resource addresses. Scanner code data is defined to be data derived from a scanner code. In one embodiment of the present invention, data corresponding to a single scanner code is correlated with several resource addresses. In another embodiment of the present invention, a single resource address is associated with data from several scanner codes.

In accordance with the method of the present invention, a scanner code is read by scanner 103, which derives data from the scanner code and sends it to the client 102. Client 102 sends a message including scanner code data through network 101 to server 104. Server 104 then queries database 105 for addresses correlated to the scanner code data received from client 102. Database 105 returns the addresses correlated with the scanner code data to server 103, which forwards the resource addresses to the client 102 through network 101. In this way, the client is advantageously able to determine the resource addresses of information resources pertinent to the product corresponding to the scanner code.

When client 102 receives the resource addresses, it presents those addresses to the user through an output device. In one embodiment, for example, if network 101 is the Internet and site A 106, site B 107 and site C 108 are Web Sites, the resource addresses provided to the user by the client are Uniform Resource Locators (URL).

In accordance with one embodiment of the present invention, summary information regarding the contents of an information resource corresponding to an address is presented to the user along with the address. For example, when the user is

presented with a URL for an information resource pertaining to a can of soup, the corresponding summary information can be presented immediately below the address; the summary information can indicate that the resource at the above address pertains to the nutritional value of the ingredients contained in the soup. This advantageously allows the user to assess the contents of an information resource at a given address.

The summary information can be contained with the database containing records that correlate scanner code data with resource addresses of information resources on the network. The database records can also correlate the scanner code data with the summary information.

In another embodiment, the scanner code has information coded in one dimension of the scanner code. For example, in one embodiment, the scanner code is a Universal Product Code (UPC). In another embodiment, the scanner code is a Stock Keeping Unit (SKU). In yet another embodiment of the present invention, the scanner code has information coded in two dimensions. For example, the two-dimensional scanner code in one embodiment is a Code 49 scanner code introduced by the Intermec Corporation in 1988.

FIG. 2 shows a graphical user interface (GUI) 200 used to display search results to a user according to an embodiment of the present invention. GUI 200 is presented to the user through an output device connected to the client 102. In this example, the user has scanned a UPC code to obtain the address of information resources pertaining to the product on which the UPC code is found.

GUI 200 provides a title ("UPC search service"), which is displayed in field 201. For the purposes of providing the user with a means of authenticating the accuracy of the UPC code scanned by scanner code reader 103, a graphic representation of the UPC code is displayed to the user in field 202. Below the graphic representation of the scanner code in field 202, the numeric equivalent of the UPC code is displayed in field 203. When the UPC graphic displayed in field 202 and its numeric equivalent displayed in field 203 duplicates the UPC code displayed on the product, the user is assured that the scanner has accurately read the UPC code from the product and the number underneath. An example of a UPC code is shown in FIG. 3 for illustrative purposes.

As seen in FIG. 3, the scanner code for a UPC label comprises a bar code data 250 and a number 260 which is a numeric equivalent of the data contained in the graphic part of the code 250. In response to scanning a graphic scanner code, client 102 provides the user with a URL displayed in field 204 relating directly to the scanned product. Additional resource addresses shown in field 205 can also be displayed to the user. The resource addresses shown in field 205 correspond to information resources that are related to the information resource corresponding to the primary network address shown in field 204.

FIG. 4 shows a GUI 300 used to display search results to a user according to another embodiment of the present invention. GUI 300 provides a title ("UPC search service") in field 301. A graphical representation of the UPC code is displayed to the

user in field 302; the numeric representation of the scanner code is displayed in field 303. In response to scanning a graphic scanner code, several resource addresses corresponding to the scanned product are displayed to the user in fields 304, 306, 308 and 310.

Each address relates to a different aspect of the scanned product. By allowing the user to select the most relevant resource address relating to the scanned product, this embodiment of the present invention tailors the search results to the user's specific interests. For example, field 304 displays the resource address related to the product's nutritional information; field 306 displays the resource address related to the product's content information; field 308 displays the resource information related to the recipes using the scanned product; field 310 displays the resource information related to the manufacturer.

For each displayed resource address, a corresponding description of the information resource can also be provided. Specifically, fields 305, 307, 309 and 311 display a description relating to the resource addresses displayed in fields 304, 306, 308 and 310, respectively. Just as the resources addresses are correlated with the scanner code data, these descriptions relating to the resource addresses can also be correlated with the scanner code data. These descriptions can be obtained or created when the resource addresses are correlated with the scanner code data. These descriptions can be stored in database 105 as shown FIG. 1.

In accordance with another embodiment of the present invention, the primary

information resource is displayed to the user while the addresses of related information resources are also displayed to the user. Client 102 executes software that receives the resource address and automatically sends a request to the server storing the information resource at the address provided, requesting the server to send the resource to the client. In one embodiment of the present invention, this software comprises a browser executing a client side application program. An example of such a browser is the Netscape Navigator manufactured by the Netscape Communications company of California. Upon receiving the request message from the client, the server sends a copy of the requested resource to the client 102, which then displays the resource to the user. While the primary information resource is displayed to the user, the addresses of related information resources are also provided to the user, for example, within a separate frame. Consequently, the user can simultaneously view the primary information resource and, within a separate frame, the addresses of related information resources. This advantageously allows a user to provide scanner code data to the client and see the correlated information resource immediately while allowing the user to select the addresses of other, potentially more relevant, information resources.

In accordance with another embodiment of the present invention, the server can act as a proxy server. Rather than sending an information resource address to the user, a server acting as a proxy server sends a request for information from the network resource based on the resource address. When the server receives the information, the server forwards the information to the user. A proxy server allows the user to obtain the information from the network resource without the network resource determining the

user's identity because the request appears to originate at the proxy server.

Another embodiment of the present invention is shown in FIG. 5. Network 501 interconnects computer 502 with sites A 505, B 506 and C 507. Computer 502 is connected to database 504, scanner code reader 503 and output device 508. In the embodiment shown in FIG. 5, database 504 is directly accessed by computer 502 rather than through a server connected by a network, as is the case with the embodiment shown in FIG. 2.

In another embodiment of the present invention, the scanner code data can contain information directly related to the network address and which can be supplemented to obtain the full network address. FIG. 6 a flowchart illustrating the method according to this embodiment of the present invention.

At step 700, a server receives scanner code data from the user. The scanner code data can be, for example, derived from a UPC. The scanner code data can be directly related to a network address; for example, where the network address is a URL, the scanner code data can equal the unique portion of the URL.

At step 710, the server builds a URL from the scanner code data. The server queries a database to obtain the supplemental information necessary to construct a full network address. The supplement information contained in the database can include, for example, a prefix such as "http://www." and/or a suffix such as ".com". Using the example illustrated in FIG. 3, the scanner code data can consist of the numeric

equivalent that identifies "hannibals". The corresponding URL can then be constructed, for example, by adding a prefix such as "http://www." and/or by adding a suffix such as ".com". Thus, following this example, the constructed URL would be <http://www.hannibals.com>.

At conditional step 720, the server is cheeked to determine whether it is acting as a proxy server. If the server is not acting as a proxy server, then the process proceeds to step 730. At step 730, the URL is sent to the user. At step 740, the user sends a request for the network resource based on the received URL. At step 750, the network resource is sent to the user based on the URL.

At conditional step 720, if the server is acting as a proxy server, then the process proceeds to step 760. At step 760, the proxy server sends a request for information from the network resource based on the URL. At step 770, the proxy server receives and passes the information from the network resource to the user. The proxy server allows the user to obtain the network resource without the network resource determining the user's identity because the request appears to originate at the proxy server.

FIG. 7 shows a system block diagram of a communication network according to another embodiment of the present invention. Network 600 interconnects peer A 610, peer B 620 and server 630. Server 630 is connected to database 640.

Peer A 610 and peer B 620 are network nodes where users can access network

600. Peer A 610 and Peer B comprise a processor, computer readable memory, an input port to be coupled to an input device (not shown) such as a scanner code reader, an output port to be coupled to an output device (not shown), and a network port to be coupled to network 600.

Peer A 610 and peer B 620 are operating special software that allows both to listen for attempts by other peer systems to establish communications over network 600. Peer A 610 and peer B 620 have network addresses. An example of a network address is a URL.

Server 630 comprises processor, computer-readable memory, a database port to be coupled to database 640, and a network port to be coupled to network 600. The server 630 also comprises a data bus that interconnects the processor, computer readable memory, database port, and network port. Database 640 comprises computer readable memory that is accessed by server 630. Database 640 stores scanner code data correlated with resource addresses. Scanner code data is defined to be data derived from a scanner code. In one embodiment of the present invention, data corresponding to a single scanner code is correlated with at least one network address.

FIG. 8 is a flowchart that illustrates a method for establishing telephone calls over the communications network according to an embodiment of the present inv ention. In this embodiment of the present invention, a user at peer A 610 can establish communications with peer B 620 through network 600.

At step 650, server 630 receives the scanner code data that is derived by peer A 610 from the scanner code. At step 660, server 630 queries database 640 for network addresses corresponding to the scanner code data.

At conditional step 670, if no matching network address is found in database 640, the process proceeds to step 675 where an error message is generated and returned to peer A 610. At conditional step 670, if a matching network address is found, the process proceeds to step 680.

At step 680, server 630 sends the matching network address to peer A 610. At step 690, peer A 610 uses the matching network address to establish communication with peer B 620 through network 620.

FIG. 9 illustrates a communications system that allows a calling party to initiate a telephone call a telephone network based on scanner code data, according to another embodiment of the present invention. Data network 800 is connected to client A 810 and server 820. Server 820 is connected to database 830 and telephone network 840. Telephone network 840 is connected to communication device 850, communication device 860 and telephone network bridge. As shown in FIG. 9, the calling party is assumed to be located at client 810 and communication device 850, and the called party is assumed to be located at communication device 860.

Data network 800 can be, for example, the Internet or a corporate intranet. Telephone network 840 can be the Public Switched Telephone Network (PSTN), an

international network, or any combination. Communication devices 850 and 860 can be any of a variety of types such as a telephone, a facsimile machine or a personal computer. Communication devices 850 and 860 transmit and receive information. The term "information" as used herein is intended to include data, text, voice, audio, video and/or multimedia. Telephone network bridge 870 allows connects between data network 800 and telephone network 840.

FIG. 10 is a flowchart illustrating a method for placing a call over the telephone network based on scanner code data, using the communications network shown in FIG. 9, according to an embodiment of the present invention. At step 900, server 820 receives the scanner code data and the calling party's telephone number from client 810 through data network 800. At step 910, server 820 queries database 830 to obtain the called party's telephone number based on the received scanner code data.

At conditional step 920, if no telephone number for the called party is found in database 830 based on the scanner code data, then the process proceeds to step 930 where an error message is delivered to client 810. If a telephone number for the called party is found in database 830, then the process proceeds to step 940.

At step 940, server 820 sends the calling party's telephone number and the called party's telephone number to telephone network bridge 870. At step 950, telephone network bridge 870 establishes a connection between communication device 850 and communication device 860 over telephone network 840.

In another embodiment of the present invention, the database correlates calling parties' network addresses with calling parties telephone numbers, as well as scanner code data with called parties' telephone numbers. The server can receive scanner code data and a calling party network address from the calling party, can search the database obtain the calling party and called party's telephone numbers, and can forward these telephone numbers to the telephone network bridge. The bridge then connects the calling party and the called party in known fashion.

It should of course be understood that while the present invention has been described and referenced to particular system configurations, scanner code formats and information resource types, other configurations are encompassed by the present invention, as is apparent to those of ordinary skill in the art. For example, present invention can include any a plurality of clients, multiple servers connected to databases that include any data correlated with information resource addresses.

The present invention advantageously provides an efficient way to accurately determine the location of an information resource directly pertinent to a given product or service, even when the information resource is stored on a large network with many nodes storing many information resources. The present invention advantageously allows user interaction in the process of submitting scanner code data to retrieve information resources. By interposing the step of returning information resource addresses to the user, and then allowing the user to pick and choose which information resources to access, the present invention advantageously allows the user to tailor the information

eventually presented to the user regarding a particular product. Similarly, the present invention advantageously allows a product manufacturer or service provider to select which information resource addresses are correlated with the scanner code associated with a particular product or service. Further, the present invention advantageously scales better than known search methods. Known search methods are more likely to return a larger number of less relevant responses as the number of information resources stored on a network increases. The present invention operates with the same efficiency regardless of the number of information resources stored on the network.

What is claimed is:

1. A method for obtaining a plurality of information resource addresses using a scanner code, the information resources being on a network, comprising:

(a) receiving scanner code data from a client;

(b) querying a database correlating the scanner code data with the plurality of information resource addresses; and

(c) providing the plurality of information resource addresses to the client.

2. The method of claim 1, wherein the scanner code has information coded in one dimension of the scanner code.

3. The method of claim 2, wherein the scanner code is Universal Product Code.

4. The method of claim 2, wherein the scanner code is Stock Keeping Unit.

5. The method of claim 1, wherein the scanner code has information coded in two dimensions of the scanner code.

6. The method of claim 1, wherein said step (a) receives scanner code data from an optical scanner.

7. The method of claim 1, wherein the information resource address is a uniform

resource locator.

8. The method of claim 1, further comprising the step of:

(d) sending a request for information from the client to an information resource located at an information resource address provided in said step (c); and

(e) sending information from the information resource receiving the request in said step (d) to the client.

9. The method of claim 1, wherein the information resource address is provided to the client through an output device.

10. The method of claim 9, wherein the output device is a display and the information resource address is provided through a graphical user interface.

11. An apparatus for obtaining a plurality of addresses of information resources on a network using a scanner code, comprising:

a server having a processor, computer readable memory, a database port to be coupled to a database, a network port to be coupled to the network, and a data bus connecting said processor, computer readable memory and network port;

a client having a processor, computer readable memory, a database port to be coupled to a database, an input port to be coupled to an input device, a network port to be coupled to the network, an output port to be coupled to an output device, and a data

bus connected said processor, computer readable memory, input port, network port and output port; and

a database coupled to said server through said database port, said database comprising information resource address correlated with scanner code data, said database receiving scanner code data from said client and sending the plurality of information resource addresses corresponding to the scanner code data to said client.

12. The apparatus of claim 11, wherein the input device is an optical scanner.

13. The apparatus of claim 11, wherein the output device is connected to the output port of said client.

14. The apparatus of claim 13, wherein the output device is at least one from the group of: a display, a printer, and a speaker.

15. The apparatus of claim 11, wherein the scanner code has information coded in one dimension of the scanner code.

16. The apparatus of claim 15, wherein the scanner code is Universal Product Code.

17. The apparatus of claim 15, wherein the scanner code is Stock Keeping Unit.

18. The apparatus of claim 11, wherein the scanner code has information coded in two dimensions of the scanner code.

19. The apparatus of claim 11, wherein the information resource address is a

uniform resource locator.

20. The apparatus of claim 11, wherein said client sends a request for information from said client to an information resource located at one information resource address from the plurality, said client receiving information from the information resource.

21. A method for obtaining a hypertext link for an information resource using a scanner code, the information resource being on a network, comprising:

(a) receiving scanner code data from a client;

(b) querying a database correlating the scanner code data with hypertext link; and

(c) providing the hypertext link from step (b) to the client.

22. The method of claim 21, wherein the hypertext link is a uniform resource locator.

23. The method of claim 21, wherein the network is the Internet.

24. The method of claim 21, wherein the scanner code has information coded in one dimension of the scanner code.

25. The method of claim 21, wherein the scanner code is Universal Product Code.

26. The method of claim 21, wherein the scanner code is Stock Keeping Unit.

27. The method of claim 21, wherein the scanner code has information coded in two dimensions of the scanner code.

28. The method of claim 21, wherein said step (a) receives scanner code data from an optical scanner.

29. The method of claim 21, further comprising the steps of:

(d) sending a request for information from the client to an information resource located at the hypertext link provided in said step (c); and

(e) sending information from the information resource receiving the request in said step (d) to the client.

30. The method of claim 21, wherein the hypertext link is provided to the user through an output device connected to the client.

31. The method of claim 30, wherein the output device is a display and the hypertext link is provided through a graphical user interface.

32. A method for obtaining a primary information resource and a plurality of addresses of related information resources using a scanner, the primary information resource and related information resources being on a network, comprising:

(a) receiving scanner code data from a client;

(b) querying a database correlating the scanner code data with an

address of the primary resource and a plurality of addresses of related information resource; and

(c) providing the primary information resource and the addresses of related information resources.

33. A system for obtaining a plurality of resource addresses of information resources using a scanner code, comprising:

means for receiving scanner code data from a user;

a database correlating the scanner code data with resource addresses of information resources;

means for querying said database; and

means for providing the plurality of resource addresses to the user.

34. A system for obtaining a hypertext link of an information resource using a scanner code, comprising:

means for receiving scanner code data from a user;

a database correlating the scanner code data with a hypertext link of an information resource;

means for querying said database; and

means for providing the selected hypertext link to the user.

35. A method for obtaining an information resource address using a scanner code, the information resource being on a network, comprising:

(a) receiving scanner code data from a client;

(b) querying a database correlating the scanner code data with supplemental address information; and

(c) constructing the information resource address using the scanner code data and the supplemental address information.

36. The method of claim 35, wherein the information resource address is a uniform resource locator.

37. The method of claim 35, further comprising:

(d) providing the information resource address to the client.

38. The method of claim 35, further comprising:

(d) sending a request for information from the client to an information resource located at the information resource address constructed in said step (c); and

(e) sending information from the information resource receiving the request in said step (d) to the client.

39. A method for establishing a call between a calling party and a called party over a telephone network, the call being initiated by the calling party from a data network, comprising:

(a) receiving scanner code data and the calling party's telephone number from the calling party;

(b) querying a database correlating the scanner code data with a called party's telephone number; and

(c) providing the calling party's telephone number and the called party's telephone number to the telephone network.

40. A method for establishing a call between a calling party and a called party over a telephone network, the call being initiated by the calling party from a data network, comprising:

(a) receiving scanner code data and the calling party's network address from the calling party;

(b) querying a database correlating the scanner code data with a called party's telephone number and the calling party's network address with the calling party's telephone number; and

(c) providing the calling party's telephone number and the called party's telephone number to the telephone network.

41. A method for establishing a call between a calling party and a called party over a data network, comprising:

(a) receiving scanner code data from the calling party;

(b) querying a database correlating the scanner code data with a network address of the called party; and

(c) providing the network address of the called party to the calling party.

42. A method for establishing a call between a calling party and a called party over a data network, comprising:

(a) receiving scanner code data from the calling party;

(b) querying a database correlating the scanner code data with a network address of the called party; and

(c) connecting the called party to the calling party based on the called party network address.

*FIG. 1*

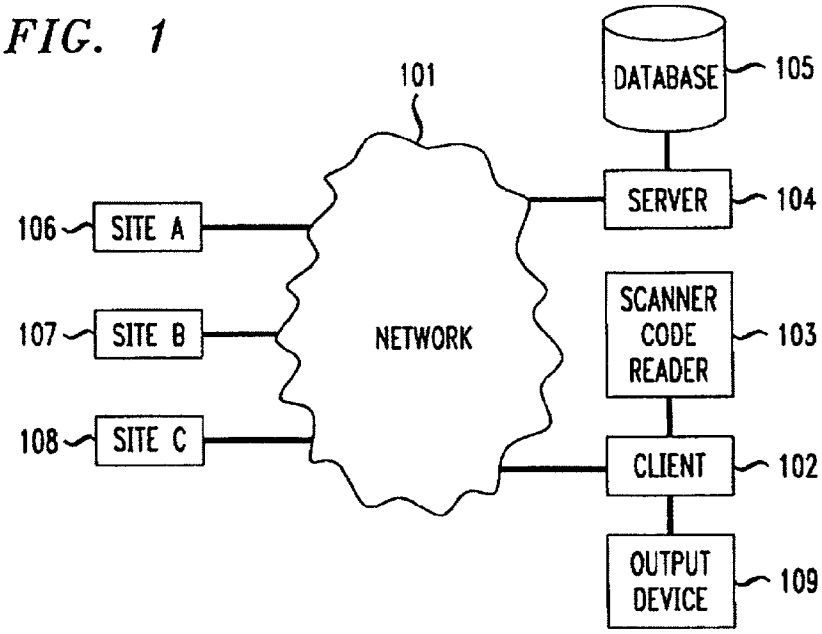

101
DATABASE
105
SERVER
104
106
SITE A
107
SITE B
NETWORK
SCANNER CODE READER
103
108
SITE C
CLIENT
102
OUTPUT DEVICE
109

*FIG. 2*

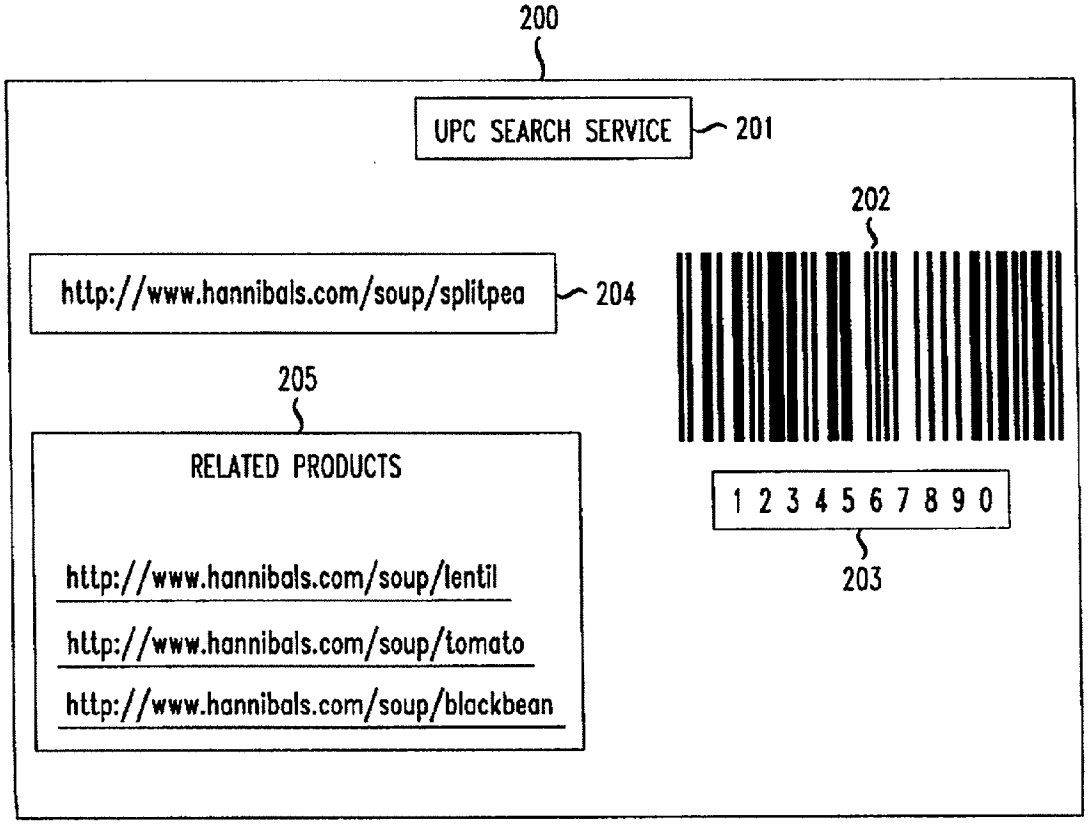

200
UPC SEARCH SERVICE
201
202
http://www.hannibals.com/soup/splitpea
204
205
RELATED PRODUCTS
http://www.hannibals.com/soup/lentil
http://www.hannibals.com/soup/tomato
http://www.hannibals.com/soup/blackbean
1 2 3 4 5 6 7 8 9 0
203

*FIG. 3*

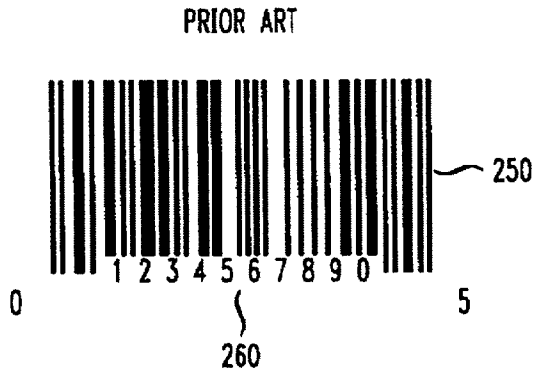

PRIOR ART
250
1 2 3 4 5 6 7 8 9 0
0
5
260

*FIG. 4*

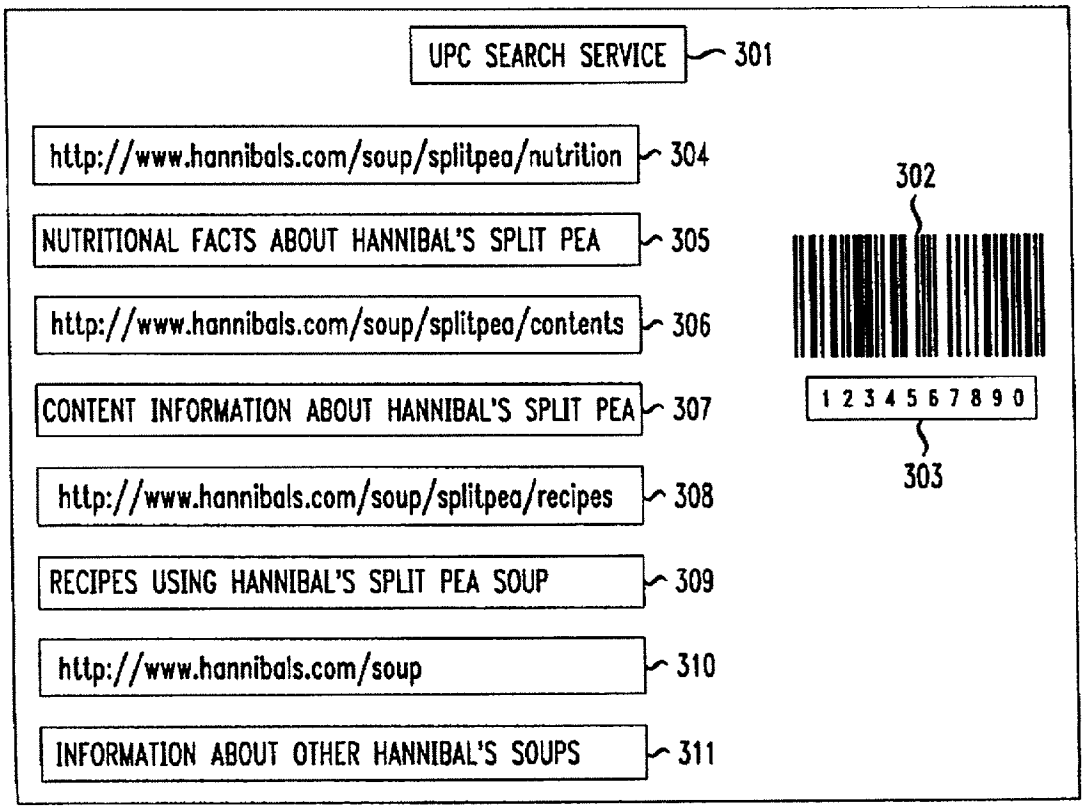

UPC SEARCH SERVICE
301
http://www.hannibals.com/soup/splitpea/nutrition
304
NUTRITIONAL FACTS ABOUT HANNIBAL'S SPLIT PEA
305
http://www.hannibals.com/soup/splitpea/contents
306
CONTENT INFORMATION ABOUT HANNIBAL'S SPLIT PEA
307
http://www.hannibals.com/soup/splitpea/recipes
308
RECIPES USING HANNIBAL'S SPLIT PEA SOUP
309
http://www.hannibals.com/soup
310
INFORMATION ABOUT OTHER HANNIBAL'S SOUPS
311
302
1 2 3 4 5 6 7 8 9 0
303

*FIG. 5*

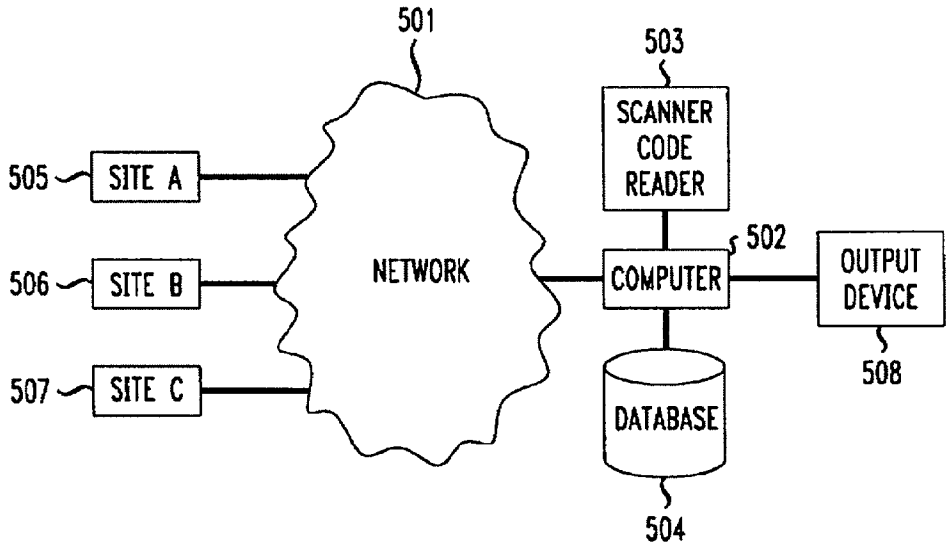

501
503
SCANNER CODE READER
505
SITE A
506
SITE B
507
SITE C
NETWORK
COMPUTER
502
OUTPUT DEVICE
508
DATABASE
504

*FIG. 6*

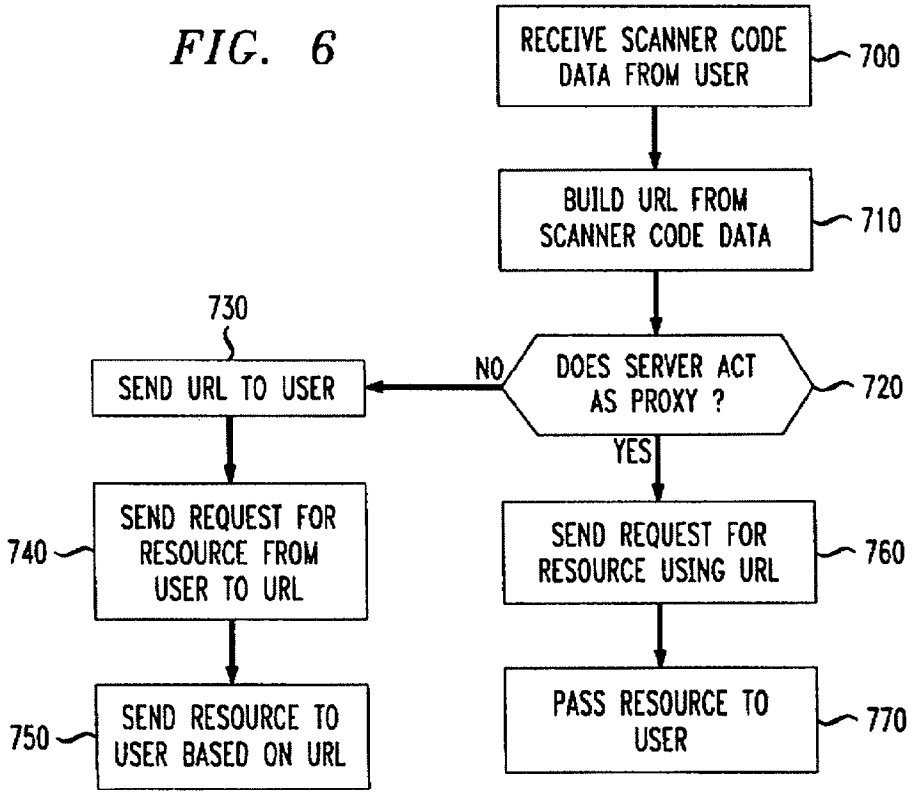

RECEIVE SCANNER CODE DATA FROM USER
700
BUILD URL FROM SCANNER CODE DATA
710
730
NO
DOES SERVER ACT AS PROXY ?
720
SEND URL TO USER
YES
SEND REQUEST FOR RESOURCE FROM USER TO URL
740
SEND REQUEST FOR RESOURCE USING URL
760
SEND RESOURCE TO USER BASED ON URL
750
PASS RESOURCE TO USER
770

FIG. 7

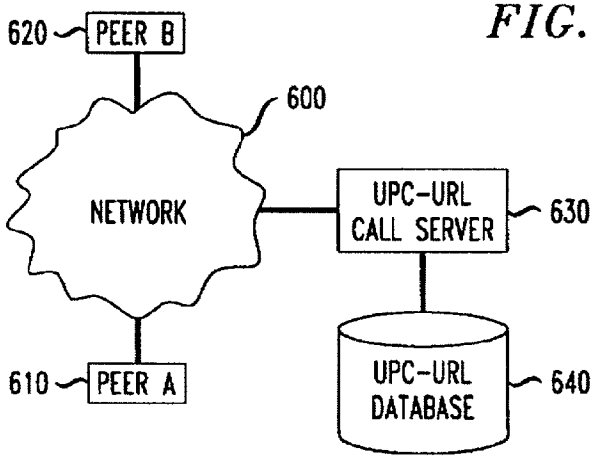

620
PEER B
600
NETWORK
UPC-URL
CALL SERVER
630
610
PEER A
UPC-URL
DATABASE
640

FIG. 8

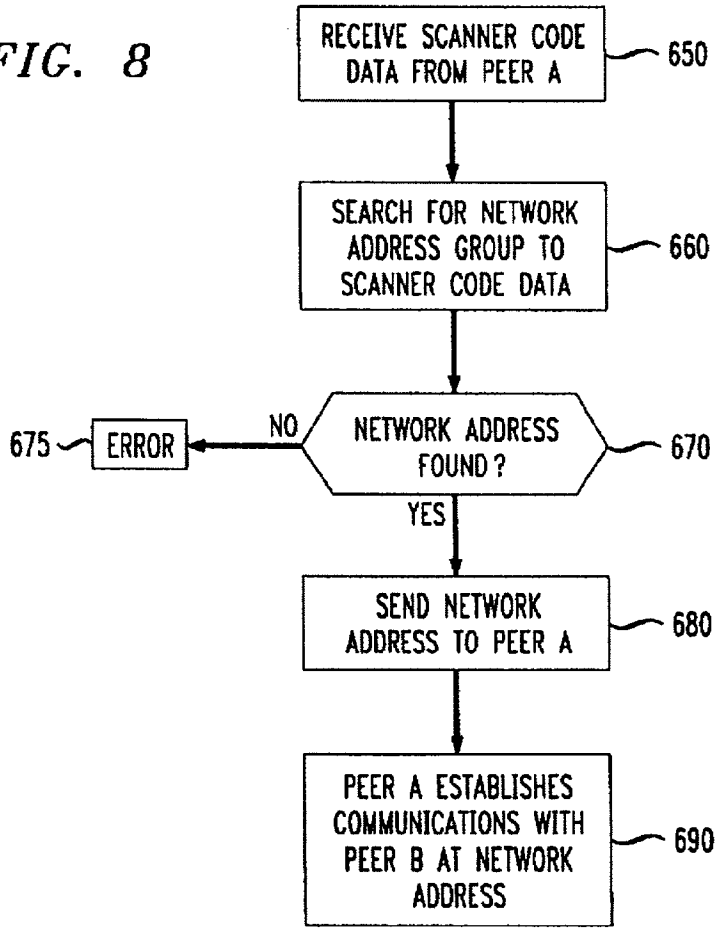

RECEIVE SCANNER CODE DATA FROM PEER A
650
SEARCH FOR NETWORK ADDRESS GROUP TO SCANNER CODE DATA
660
NETWORK ADDRESS FOUND?
670
NO
675
ERROR
YES
SEND NETWORK ADDRESS TO PEER A
680
PEER A ESTABLISHES COMMUNICATIONS WITH PEER B AT NETWORK ADDRESS
690

FIG. 9

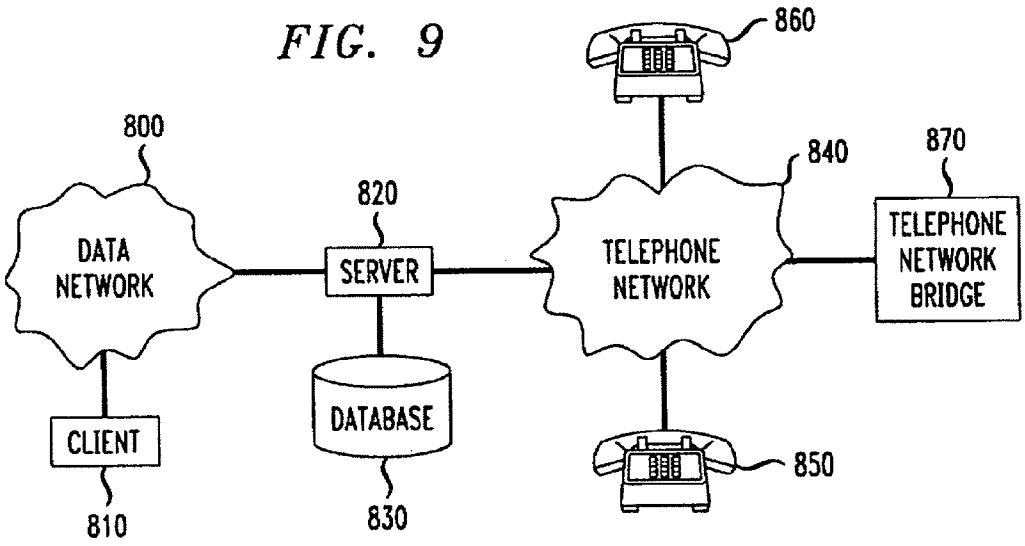
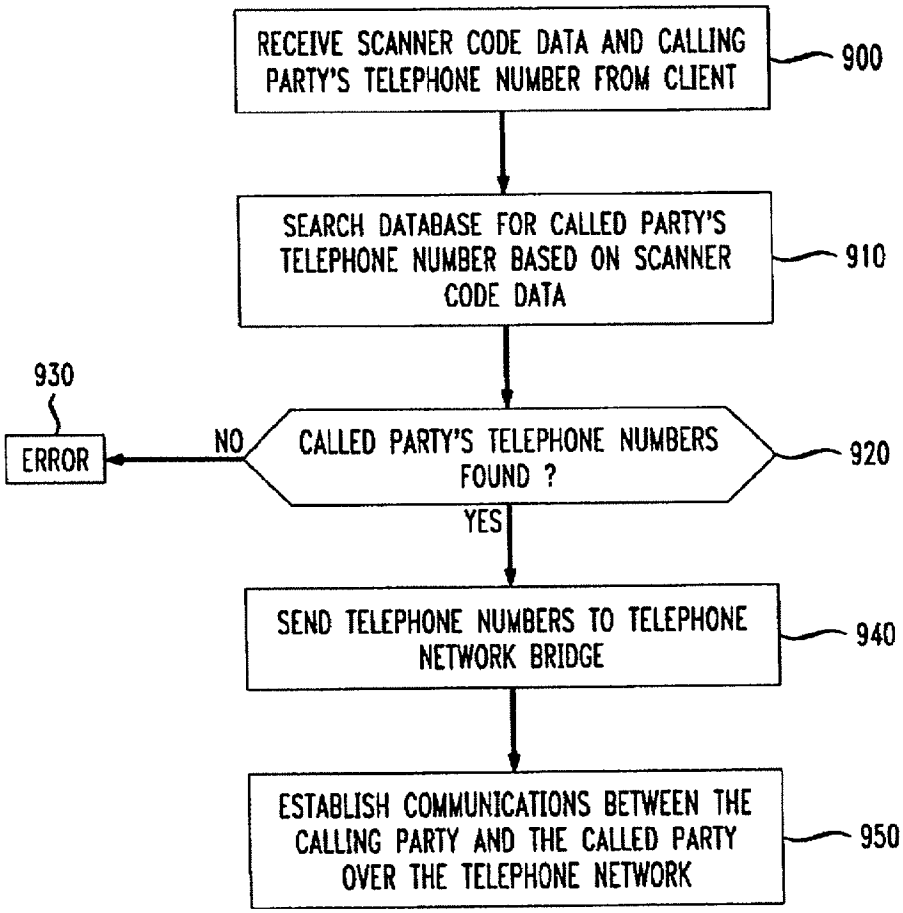

860
800
840
870
820
DATA NETWORK
SERVER
TELEPHONE NETWORK
TELEPHONE NETWORK BRIDGE
DATABASE
CLIENT
850
810
830

FIG. 10


RECEIVE SCANNER CODE DATA AND CALLING PARTY'S TELEPHONE NUMBER FROM CLIENT
900
SEARCH DATABASE FOR CALLED PARTY'S TELEPHONE NUMBER BASED ON SCANNER CODE DATA
910
930
ERROR
NO
CALLED PARTY'S TELEPHONE NUMBERS FOUND ?
920
YES
SEND TELEPHONE NUMBERS TO TELEPHONE NETWORK BRIDGE
940
ESTABLISH COMMUNICATIONS BETWEEN THE CALLING PARTY AND THE CALLED PARTY OVER THE TELEPHONE NETWORK
950

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## Abstract

Dynamic mobile coupons (DMCs) having a variable commercial value and/or o ther variable coupon characteristic are provided herein. By way of example, a DMC can be distributed to a mobile device based on criteria established by a sponsor of the DMC. A redemption value of the DMC can be variable and dyn amically established based at least in part on data associated with a recipi ent mobile device. Upon redemption of the DMC at a retail entity, the value is fixed and applied to a transaction. Details of the transaction are provid ed to a remote clearinghouse that performs mediation and indemnification fun ctions to finalize the transaction. As described, the subject disclosure pro vides a DMC that facilitates a rich and flexible mechanism to generate purch asing incentive for consumers in a mobile environment.

Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

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(54) Titre : COUPON ELECTRONIQUE DYNAMIQUE POUR ENVIRONNEMENT MOBILE
(54) Title: DYNAMIC ELECTRONIC COUPON FOR A MOBILE ENVIRONMENT

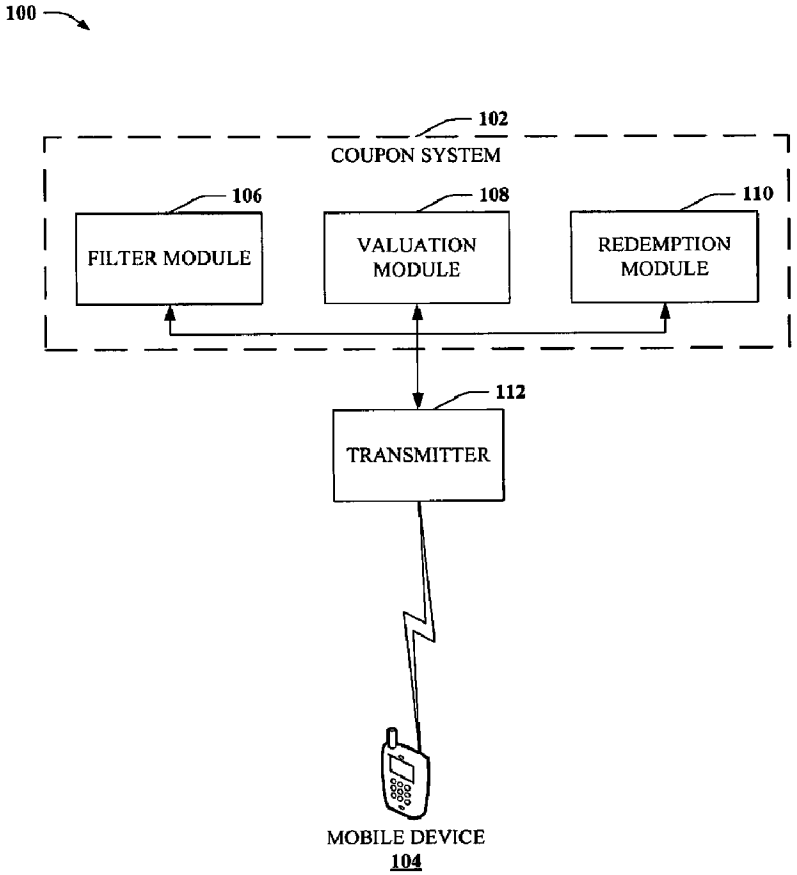


**FIG. 1**

(57) Abrégé/Abstract:
Dynamic mobile coupons (DMCs) having a variable commercial value and/or other variable coupon characteristic are provided herein. By way of example, a DMC can be distributed to a mobile device based on criteria established by a sponsor of the DMC. A

(21) 2 688 189

(13) A1

(57) Abrégé(suite)/Abstract(continued):
redemption value of the DMC can be variable and dynamically established based at least in part on data associated with a recipient mobile device. Upon redemption of the DMC at a retail entity, the value is fixed and applied to a transaction. Details of the transaction are provided to a remote clearinghouse that performs mediation and indemnification functions to finalize the transaction. As described, the subject disclosure provides a DMC that facilitates a rich and flexible mechanism to generate purchasing incentive for consumers in a mobile environment.

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12/142,159 19 June 2008 (19.06.2008) US

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(54) Title: DYNAMIC ELECTRONIC COUPON FOR A MOBILE ENVIRONMENT

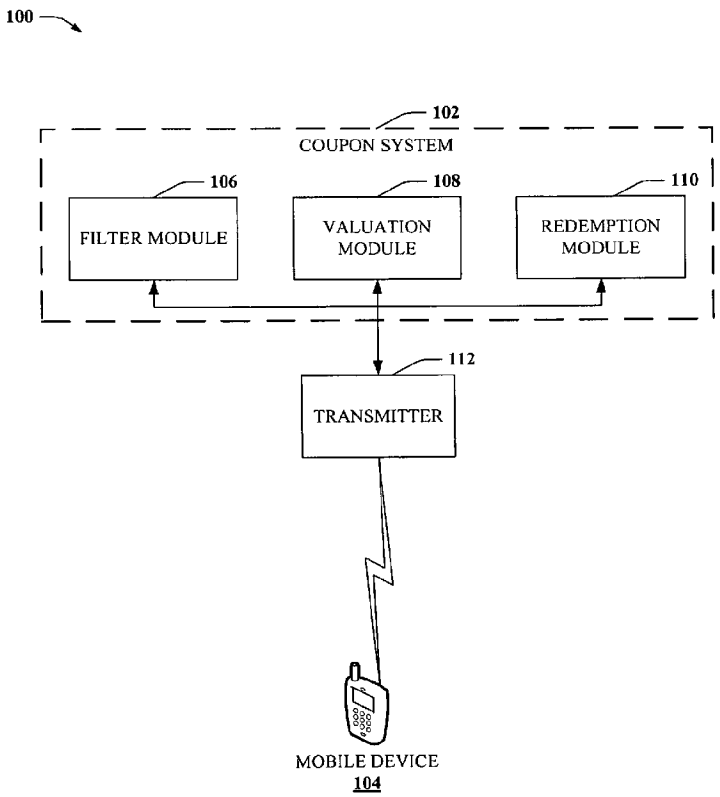


FIG. 1

(57) Abstract: Dynamic mobile coupons (DMCs) having a variable commercial value and/or other variable coupon characteristic are provided herein. By way of example, a DMC can be distributed to a mobile device based on criteria established by a sponsor of the DMC. A redemption value of the DMC can be variable and dynamically established based at least in part on data associated with a recipient mobile device. Upon redemption of the DMC at a retail entity, the value is fixed and applied to a transaction. Details of the transaction are provided to a remote clearinghouse that performs mediation and indemnification functions to finalize the transaction. As described, the subject disclosure provides a DMC that facilitates a rich and flexible mechanism to generate purchasing incentive for consumers in a mobile environment.

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# DYNAMIC ELECTRONIC COUPON FOR A MOBILE ENVIRONMENT

## Claim of Priority under 35 U.S.C. §119

**[0001]** The present Application for Patent claims priority to Provisional Application No. 60/945,098 entitled DYNAMIC COUPON SYSTEM filed June 20, 2007, and assigned to the assignee hereof and hereby expressly incorporated by reference herein.

## BACKGROUND

**[0002]** The following relates generally to a mobile operating environment, and more particularly to providing dynamic mobile coupons in such a mobile operating environment.

**[0003]** In recent years, a variety of advancements has occurred in cellular communication technology and cellular communication devices. Some of the advancements, such as integration of camera and video recording technology onto such devices, incorporation of e-mail and short messaging services into mobile communication, and the like, involve software and/or hardware applications. These applications have added increased flexibility, processing power, communication capabilities, and so forth, to already popular communication devices (*e.g.*, cellular telephones). As a result, such devices have become more popular in a consumer marketplace, motivating larger numbers of consumers to purchase such devices, or to upgrade to devices that include new applications and technologies.

**[0004]** As larger numbers of consumers own and utilize mobile devices, business mechanisms traditionally limited to personal, radio, television or landline telephone contact are expanding into the mobile environment. For instance, as the Internet becomes increasingly accessible *via* mobile communication devices, e-mail and web browsing applications are utilized with mobile devices. Further, electronic commerce is conducted by way of such devices as well. For instance, secure web applications can provide an interface for conducting online commercial transactions with a web browsing device.

Credit card, debit card, bank transfer and like payments can be facilitated utilizing secure web applications by way of such device.

**[0005]** In addition to the foregoing, other commercial mechanisms have also been incorporated into mobile devices and mobile communication environments. For instance, electronic coupons stored on mobile devices can be utilized to replace paper coupons. A commercial entity can generate coupons and distribute them to mobile devices, which can in turn facilitate redemption of coupons in conjunction with commercial transactions. As electronic files, such coupons have more flexibility than traditional paper coupons. For instance, a paper coupon is more readily misplaced as compared with an electronic coupon stored on a mobile device. Further, an electronic coupon can incorporate various security measures to mitigate duplication and other unauthorized uses. Accordingly, many benefits accrue upon introduction of electronic coupons in a mobile operating environment.

## SUMMARY

**[0006]** The following presents a simplified summary of one or more aspects in order to provide a basic understanding of such aspects. This summary is not an extensive overview of all contemplated aspects, and is intended to neither identify key or critical elements of all aspects nor delineate the scope of any or all aspects. Its sole purpose is to present some concepts of one or more aspects in a simplified form as a prelude to the more detailed description that is presented later.

**[0007]** Disclosed herein are dynamic electronic coupons configured for a mobile device and having a variable characteristic, such as commercial value, in conjunction with a commercial transaction. Such electronic coupons, or dynamic mobile coupons (DMCs) as configured for a mobile device, can be delivered to the mobile device from a voice and/or data service provider, retail entity, third party supplier, or the like. The variable characteristic of the DMC is established based at least in part on a factor pertinent to a recipient mobile device, a user of the device, a coupon profile provided by a sponsor of the coupon, *etc.*

**[0008]** A variable characteristic of a DMC can be determined prior to transmitting the DMC to a recipient device. Alternatively, or in addition, the variable characteristic of

the DMC can be determined after transmission of the DMC to the recipient device. Further, in at least some aspects, a determined characteristic can be dynamically updated based on additional circumstances and/or criteria. Upon redemption of the DMC, the characteristic is fixed and at least an aspect of the characteristic is applied to a transaction. Data pertaining to the transaction and the DMC can be sent to a clearinghouse entity that facilitates payment or reimbursement, where suitable, to a retail entity that redeems the coupon (*e.g.*, a retail store). Therefore, the subject disclosure describes a DMC that facilitates a rich and flexible mechanism to generate purchasing incentive for consumers in a mobile environment.

**[0009]** In one or more aspects, disclosed is a method of providing an electronic coupon in a mobile operating environment. The method comprises associating a DMC with a target mobile device wherein the DMC has at least one variable coupon characteristic. Further, the method can comprise establishing an initial parameter for variable coupon characteristic(s) based on a determinable circumstance pertinent to the target mobile device or a user account of/associated with the device. In some aspects, the method can comprise communicatively coupling with a clearinghouse in conjunction with applying the value of the DMC to a transaction.

**[0010]** In some aspects, described is an apparatus that facilitates distribution, redemption, or valuation of an electronic coupon in a mobile environment. The apparatus can comprise a coupon module that associates a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic. The apparatus can further comprise a valuation module that establishes an initial parameter of the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device or a user account of/associated with the device. The apparatus can also include memory that stores at least the coupon module and the valuation module to facilitate DMC distribution by the apparatus, and a processor that executes the modules. Optionally, the apparatus can include a wired and/or wireless interface that sends the DMC or an indication thereof to the selected mobile device.

**[0011]** In accordance with one or more additional aspects, disclosed is a DMC distribution device. The DMC distribution device can comprise a first module configured to associate a DMC with a target mobile device, wherein the DMC has at least one

variable coupon characteristic. Further, the device can comprise a third module configured to establish an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device or a user account of/associated with the device. The distribution device can optionally include a fourth module configured to communicatively couple with a clearinghouse in conjunction with applying the value of the DMC to a transaction.

**[0012]** According to a further aspect, described is an apparatus configured to provide an electronic coupon in a mobile operating environment. The apparatus can comprise means for associating a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic. Further, the apparatus can comprise means for establishing an initial parameter of the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device or a user account of/associated with the device.

**[0013]** In at least one additional aspect, disclosed is a computer program product for communication between remote devices. The computer program product comprises a computer-readable medium containing instructions executable by at least one computer to associate a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic. Moreover, the instructions can be executable by the at least one computer to establish an initial parameter of the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device or a user account of/associated with the device.

**[0014]** According to one or more other aspects, provided is a method of communication between remote devices. The method can comprise obtaining data from a device; the data comprises a DMC or an indication of the DMC and further comprises at least one variable coupon characteristic. Further, the method can comprise obtaining a factor relevant to establishing an initial parameter for the variable coupon characteristic and collecting data pertinent to the factor to facilitate establishing the initial parameter.

**[0015]** In additional aspects, disclosed is an apparatus that facilitates implementing a dynamic electronic coupon in a mobile environment. The apparatus comprises a transceiver that obtains a DMC having at least one variable coupon characteristic, or an indication of such DMC and characteristic, and at least one factor

relevant to establishing an initial parameter for the variable coupon characteristic. The apparatus can further comprise memory that stores the DMC or factor(s) and a valuation engine that collects data pertinent to the at least one factor to facilitate establishing the initial parameter for the variable coupon characteristic.

**[0016]** According to a further aspect, provided is a mobile device. The mobile device can comprise a transceiver configured for wired and/or wireless data exchange with a remote device. The mobile device can further include a first module configured to obtain a DMC or an indication of the DMC from the remote device, wherein the DMC has at least one variable coupon characteristic. Further, the mobile device can comprise a second module configured to obtain at least one factor relevant to establishing an initial parameter for the variable coupon characteristic and a third module configured to collect data pertinent to the factor(s) to facilitate establishing of the initial parameter.

**[0017]** According to an additional aspect, provided is an apparatus configured for communication with a remote device. The apparatus can comprise means for obtaining a DMC or an indication of the DMC from a device, wherein the DMC has at least one variable coupon characteristic. Moreover, the apparatus can comprise means for obtaining at least one factor relevant to establishing an initial parameter for the variable coupon characteristic and means for collecting data pertinent to the at least one factor to facilitate establishing the initial parameter.

**[0018]** In accordance with still another aspect, disclosed is a computer program product configured for communication with a remote device. The computer program produce can comprise a computer-readable medium containing instructions executable to obtain a DMC or an indication of the DMC from a device, wherein the DMC has at least one variable coupon characteristic. The instructions can be further executable to obtain at least one factor relevant to establishing an initial parameter for the variable coupon characteristic and to collect data pertinent to the at least one factor to facilitate establishing the initial parameter.

**[0019]** To the accomplishment of the foregoing and related ends, the one or more aspects comprise the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings set forth in detail certain illustrative aspects of the one or more aspects. These aspects are indicative, however, of

but a few of the various ways in which the principles of various aspects can be employed and the described aspects are intended to include all such aspects and their equivalents.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0020]** **Fig. 1** depicts a block diagram of an example system that provides variable value dynamic mobile coupons (DMCs) in a mobile operating environment.

**[0021]** **Fig. 2** illustrates a block diagram of an example system that facilitates distribution, redemption, and reimbursement of DMCs.

**[0022]** **Fig. 3** depicts a block diagram of an example system that can dynamically valuate a DMC based on determined information according to one or more aspects.

**[0023]** **Fig. 4** illustrates a block diagram of a sample system that integrates dynamic media with a DMC and can valuate the DMC based in part on the media, according to one aspect.

**[0024]** **Fig. 5** depicts a block diagram of an example user interface that organizes and presents information pertinent to a DMC.

**[0025]** **Fig. 6** illustrates a block diagram of an example system for determining a concurrent value of a variable value DMC according to aspects.

**[0026]** **Fig. 7** depicts a block diagram of a sample mobile handset that can facilitate utilization and/or valuation of a DMC in accordance with further aspects.

**[0027]** **Fig. 8** illustrates a flowchart of a sample methodology for providing variable value DMCs in a mobile environment.

**[0028]** **Fig. 9** depicts a flowchart of an example methodology for distributing, evaluating, and redeeming variable value DMCs in accordance with one aspect.

**[0029]** **Fig. 10** illustrates a flowchart of an example methodology for facilitating use of a DMC in a mobile environment.

**[0030]** **Fig. 11** depicts a flowchart of an example methodology for facilitating valuation and redemption of variable value DMCs in a mobile environment.

**[0031]** **Figs. 12** and **13** depict block diagrams of example systems that provide and facilitate, respectively, valuation of variable value DMCs in a mobile environment.

## DETAILED DESCRIPTION

**[0032]** Various aspects are now described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of one or more aspects. It can be evident, however, that such aspect(s) can be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate describing one or more aspects.

**[0033]** The subject disclosure provides for variable characteristic electronic coupons for a mobile environment. The electronic coupons can be distributed to a particular mobile device, selected based on predetermined criteria (*e.g.*, location, time, identity, prior mobile device-based commercial transactions, features/capabilities of the mobile device, and so on). In addition, the electronic coupons can provide some value in conjunction with a commercial transaction. Particularly, the value is variable, in that it can be undetermined or adjustable at a given point in time. By adjusting the variable characteristic (*e.g.*, a redeemable value) of an electronic coupon, a consumer can be given a greater or lesser incentive to conduct the transaction at a given point in time or based on a given circumstance.

**[0034]** In addition to the foregoing, mobile coupons (*e.g.*, an electronic coupon configured for, distributed to, stored on and/or redeemed utilizing a mobile device) can be distributed based on information pertinent to a mobile device, user accounts maintained on such devices (*e.g.*, mobile coupon account), interaction with users in a user 'buddy list', and the like. The nature of mobile devices (*e.g.*, cell phone, smart phone, PDA, laptop, multi-mode phone, and so on) involves dynamic, yet generally determinable characteristics. For instance, a location of the mobile device can change over time as a user carries the mobile device, transports the mobile device in a vehicle, *etc.* Strength of signals emitted by a mobile device (*e.g.*, radio frequency [RF] signals) can vary over time as well, as location, transmission strength, battery power, or like factors associated with the mobile device change. Accordingly, a wireless device communicatively coupled with a mobile device can determine various dynamic characteristics of such device based on signals received or transmitted to such mobile device.

**[0035]** Because mobile devices involve dynamic characteristics, directed marketing involving a mobile device can be conducted based on contemporaneous conditions of such device. For instance, a mobile coupon can be distributed to the mobile device based on location of the mobile device, capabilities/functions of the mobile device, or time of day, or a combination of these or like factors. It should also be appreciated that a mobile coupon can have dynamic or variable coupon characteristics as well. In some aspects, an attribute of the coupon can depend on a dynamic characteristic of the mobile device. For instance, a redeemable value of a DMC can be based on a location of the mobile device. The foregoing example describes a mobile coupon with a dynamic characteristic and provides at least one example of a dynamic mobile coupon (DMC).

**[0036]** As a particular example of the foregoing, a redeemable value of a DMC can provide a first monetary value if the mobile device is at a first location and a second monetary value if the mobile device is not at the first location (or, *e.g.*, is not within a threshold distance of the first location). In some aspects, the redeemable value of the DMC can be independent of characteristics associated with the mobile device. As another example, the redeemable value could provide the first monetary value between 9am and 12 noon, and the second monetary value between 12 noon and 5pm, regardless of location of the mobile device. As a third example, various suitable circumstances can be combined to determine the redeemable value. For instance, the DMC can provide the first monetary value if the mobile device is at the first location between 9:00 am and 12:00 noon, and provide the second monetary value in all other circumstances. It should be appreciated that various suitable algorithms (*e.g.*, Boolean logic) are contemplated for establishing a value, or other variable coupon characteristic, of a DMC.

**[0037]** By determining changing aspects of mobile devices, DMCs can be distributed to such devices based on user profile(s) or device characteristics. In addition, because mobile coupons are electronic files, such as audio and/or video media files, mobile coupons can be rich multi-dimensional media, graphical files, programs, and the like. For instance, a DMC can be displayed and presented on a graphical display in three dimensions (simulated or actual), with various layers, animations, video, audio, sections, fonts, drawings, figures, and the like. Further, additional applications can be linked to the

DMC. As an example, product, manufacturer, distributor, and/or retail electronic media advertisements can be coupled to the DMC. Such media can utilize graphical animation to provide a rich and detailed user experience. In addition, characteristics of the DMC (*e.g.*, redeemable value) can be adjusted based on value-added incentives included with the DMC, such as a video advertisement.

**[0038]** According to one or more other aspects, DMCs can be stored and organized on a mobile device for user convenience. The DMCs can be referenced based on suitable indicia, such as supplier, product, retail entity, and the like. DMCs can also be categorized as a function of concurrent value. In addition, rules defining changes to redeemable value can be displayed, where desired. In some aspects, rules for defining value or value adjustment can be hidden or not included with the DMC. Accordingly, some DMCs can adjust or determine redeemable value based on factors undisclosed to a consumer. As described, the disclosure presents a rich and flexible environment for distributing, valuing, and redeeming mobile coupons in a mobile communication environment.

**[0039]** The disclosure herein facilitates many commercial benefits, including providing variable purchasing incentive based at least in part on dynamic factors associated with a mobile device, a stored profile of a user, manufacturer, coupon distributor, *etc.*, a dynamic commercial influence associated with a store or product (*e.g.*, current inventory), and so on. Thus, purchasing incentive provided through coupons can be dynamically tailored to fit the desires of a coupon sponsor based on fluctuating consumer and market conditions.

**[0040]** Various aspects of the disclosure are described below. It should be apparent that the teaching herein can be embodied in a wide variety of forms and that any specific structure and/or function disclosed herein is merely representative. Based on the teachings herein one skilled in the art should appreciate that an aspect disclosed herein can be implemented independently of other aspects and that two or more of these aspects can be combined in various ways. For example, an apparatus can be implemented and/or a method practiced using any number of the aspects set forth herein. In addition, an apparatus can be implemented and/or a method practiced using other structure and/or functionality in addition to or other than one or more of the aspects set forth herein. As

an example, many of the methods, devices, systems, and apparatuses described herein are described in the context of providing dynamic mobile coupons in a mobile communication environment. One skilled in the art should appreciate that similar techniques could apply to other communication environments as well.

**[0041]** As used in this disclosure, the terms "component," "system," "module," and the like are intended to refer to a computer-related entity, either hardware, software, software in execution, firmware, middle ware, microcode, and/or any combination thereof. For example, a component can be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. One or more components can reside within a process and/or thread of execution and a component can be localized on one computer and/or distributed between two or more computers. Further, these components can execute from various computer readable media having various data structures stored thereon. The components can communicate by way of local and/or remote processes such as in accordance with a signal having one or more data packets (*e.g.,* data from one component interacting with another component in a local system, distributed system, and/or across a network such as the Internet with other systems by way of the signal). Additionally, components of systems described herein can be rearranged and/or complemented by additional components in order to facilitate achieving the various aspects, goals, advantages, *etc.*, described with regard thereto, and are not limited to the precise configurations set forth in a given figure, as will be appreciated by one skilled in the art.

**[0042]** Additionally, the various illustrative logics, logical blocks, modules, and circuits described in connection with the aspects disclosed herein can be implemented or performed with a general purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any suitable combination thereof designed to perform the functions described herein. A general-purpose processor can be a microprocessor, but, in the alternative, the processor can be any conventional processor, controller, microcontroller, or state machine. A processor can also be implemented as a combination of computing devices, *e.g.*, a combination of a DSP and a microprocessor, a plurality of

microprocessors, one or more microprocessors in conjunction with a DSP core, or any other suitable configuration. Additionally, at least one processor can comprise one or more modules operable to perform one or more of the steps and/or actions described herein.

**[0043]** Furthermore, various aspects are described herein in connection with a mobile communication device (or, *e.g.*, a mobile device). A mobile communication device can also be called a system, a subscriber unit, a subscriber station, mobile station, mobile, mobile device, cellular device, multi-mode device, remote station, remote terminal, access terminal, user terminal, user agent, a user device, or user equipment, or the like. A subscriber station can be a cellular telephone, a cordless telephone, a Session Initiation Protocol (SIP) phone, a wireless local loop (WLL) station, a personal digital assistant (PDA), a handheld device having wireless connection capability, or other processing device connected to a wireless modem or similar mechanism facilitating wireless communication with a processing device.

**[0044]** Moreover, various aspects or features described herein can be implemented as a method, apparatus, or article of manufacture using standard programming and/or engineering techniques. Further, the steps and/or actions of a method or algorithm described in connection with the aspects disclosed herein can be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. Additionally, in some aspects, the steps and/or actions of a method or algorithm can reside as at least one or any combination or set of codes and/or instructions on a machine-readable medium and/or computer readable medium, which can be incorporated into a computer program product. Further, the term "article of manufacture" as used herein is intended to encompass a computer program accessible from any computer-readable device, carrier, or media. For example, computer-readable media can include but are not limited to magnetic storage devices (*e.g.*, hard disk, floppy disk, magnetic strips, etc.), optical disks (*e.g.*, compact disk (CD), digital versatile disk (DVD), etc.) smart cards, and flash memory devices (*e.g.*, card, stick, key drive, etc.). Additionally, various storage media described herein can represent one or more devices and/or other machine-readable media for storing information. The term "machine-

readable medium" can include, without being limited to, wireless channels and various other media capable of storing, containing, and/or carrying instruction(s) and/or data.

**[0045]** In addition to the foregoing, the word "exemplary" is used herein to mean serving as an example, instance, or illustration. Any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects or designs. Rather, use of the word exemplary is intended to present concepts in a concrete fashion. Furthermore, as used in this application and the appended claims, the term "or" is intended to mean an inclusive "or" rather than an exclusive "or." That is, unless specified otherwise, or clear from context, "X employs A or B" is intended to mean any of the natural inclusive permutations. That is, in this example, X could employ A, or X could employ B, or X could employ both A and B, and thus the statement "X employs A or B" is satisfied under any of the foregoing instances. In addition, the articles "a" and "an" as used in this application and the appended claims should generally be construed to mean "one or more" unless specified otherwise or clear from context to be directed to a singular form.

**[0046]** As used herein, the terms to "infer" or "inference" refer generally to the process of reasoning about or inferring states of a system, environment, and/or user from a set of observations as captured via events and/or data. Inference can be employed to identify a specific context or action, or can generate a probability distribution over states, for example. The inference can be probabilistic–that is, the computation of a probability distribution over states of interest based on a consideration of data and events. Inference can also refer to techniques employed for composing higher-level events from a set of events and/or data. Such inference results in the construction of new events or actions from a set of observed events and/or stored event data, whether or not the events are correlated in close temporal proximity, and whether the events and data come from one or several event and data sources.

**[0047]** Referring now to the drawings, **Fig. 1** depicts a block diagram of an example system 100 that can distribute and valuate mobile coupons based on dynamic and/or determinable criteria. System 100 includes a coupon system 102 coupled with a mobile handset 104 *via* a wired and/or wireless data interface (*e.g.*, a wireless transceiver 112). The coupon system 102 can generate and/or distribute a DMC to the mobile

handset 104 by employing the data interface (112). In addition, coupon system 102 can establish an initial parameter of a variable coupon characteristic (*e.g.*, redeemable value, re-distribution status, a multi-media feature) of the DMC based on a determinable circumstance(s) pertinent to the mobile device 104. Accordingly, the DMC can provide customized purchasing incentive tailored to the mobile device 104 by adjusting a redeemable value of the DMC or providing additional value based on data pertinent to the mobile device 104.

**[0048]** As utilized herein, a DMC refers to an electronic application, program, file, or the like, that can be redeemed for economic value in conjunction with a transaction, and has at least one characteristic that varies based on a determinable circumstance. In some aspects, the DMC can be a stand-alone application transmitted to an external entity (*e.g.*, mobile device 104). In other aspects, the DMC can be retained at a distribution device (*e.g.*, coupon system 102), and information identifying, describing and/or pertinent to redeeming the DMC can be transmitted to the external entity (104). In still other aspects, a DMC can be copied and shared between the distributor (102) and the external entity (104).

**[0049]** As stated above, a DMC provides some economic value in conjunction with a transaction. The transaction can include a sale, lease, rent, or a like exchange of a product, a service, and so on. The economic value can include any suitable modification of a term or condition of the transaction. For example, the economic value can be a reduction in purchase price of a product or products (*e.g.*, a percent discount, a flat reduction in price, a discount or reduction of a second product or service based on purchase of a first product or service, and so on). As another example, the economic value can be an extension of a benefit (*e.g.*, a warranty, customer service, technical support, *etc.*) associated with the transaction. It should be appreciated that the economic value can comprise any suitable economic consumer benefit utilized in conjunction with paper coupons or radio/television coupons, in addition to values and benefits specifically described herein.

**[0050]** In addition to the foregoing, a DMC is dynamic, and as such involves at least one characteristic that can vary based on determinable circumstances. For instance, the economic value of the DMC can vary. In another example, an expiration date of the

DMC can vary. In still other examples, a product or service, a retailer, conditions of redemption (*e.g.*, time, location), or like characteristics associated with the DMC, or a combination thereof, can vary. The variable characteristic can have a default state that is subsequently adjusted based on the determinable circumstances, or can have no predetermined default state. In the latter case, the state of the characteristic is undefined, or zero, until data pertaining to one or more determinable circumstances is obtained and analyzed.

**[0051]** Variable coupon characteristics of the DMC can be evaluated utilizing various factors. For instance, data pertinent to the mobile device 104, data pertinent to a sponsor/issuer of the DMC (102), data pertinent to a retail entity (*e.g.*, retail store, online store, and so on) such as in-stock volume, data pertinent to a state of a user account, or interactions with other user accounts of other devices (*e.g.*, sharing or recommending a DMC with another user), or independent factors such as time can be utilized as determinable circumstances. Such data can be collected in various manners. For instance, data pertinent to the mobile device 104 or a user account can be obtained from the mobile device 104 or by way of exchanging wireless signals (*e.g.*, RF signals) with the mobile device 104. Data pertinent to a sponsor/issuer of the DMC or to a retail entity can be obtained dynamically by way of a communication link with one or more such entities, or the data can be manually entered, or can be predefined and stored by the coupon system 102. Once collected, data can be utilized to evaluate one or more variable coupon characteristics associated with the DMC.

**[0052]** Variable coupon characteristics of a DMC (*e.g.*, redeemable value, multidimensional feature(s)) can be evaluated at any suitable time after receiving information pertinent to quantifying or qualifying such characteristic(s). For instance, a value of a DMC can be generated once an identity of a mobile device or user thereof is determined, once a location of the mobile device is determined, once a time of day is determined, or once a user/manufacturer/retailer/DMC profile is determined, or a combination thereof. According to some aspects, the characteristic can be determined prior to associating the DMC with the mobile device 104, after such association, or both (*e.g.*, an initial parameter of the characteristic can be determined prior to association and the initial value can be altered based on later conditions). According to one or more

further aspects, the characteristic can be generated in response to a user input (*e.g.*, a user input can result in collection of data, application of data to a valuation formula, and/or display of a calculated value). In another aspect, the characteristic can be determined/updated before, concurrent with, or after transmission of the DMC or an indication of the DMC to the mobile device 104. In accordance with still one or more other aspects, the characteristic can be updated at a suitable point prior to or during redemption of the coupon. An updated characteristic can be based on the determinable circumstances, a predetermined time or sequence, and/or user input. Accordingly, a DMC is a very flexible and rich entity that can provide various consumer purchasing incentives and can be updated dynamically based on changing conditions, user input, and so on.

**[0053]** It should be appreciated that variable characteristics of the DMC can be fixed to prevent further variation of the characteristic. For instance, an initial parameter (*e.g.*, quantitative amount) of a variable coupon characteristic (*e.g.*, product discount, redeemable value) can be established upon generating the DMC for a particular device/user (104), associating the DMC with the device/user (104), transmitting the DMC or an indication thereof to the device/user (104), based on a user input at the mobile device 104, upon redemption, or upon sharing/trading the DMC with another device/user, or a suitable combination thereof. In some aspects, as discussed above, the variable characteristic can continue to vary based on changes in one or more determinable circumstances after the initial parameter is established. In other aspects, the variable characteristic can be fixed based on the initial parameter and not vary further. Alternatively, or in addition, the variable characteristic can be subject to further adjustment based on a set of circumstances provided by a coupon manufacturer, based on a user input at the mobile device 104, or a suitable combination of both. As one particular example, the initial parameter of the variable coupon characteristic can be established based on a determined circumstance(s) (*e.g.*, location of the mobile device with respect to a retail outlet, and number of previous DMCs pertaining to the retail outlet that the device has received, redeemed, shared, viewed, *etc.*), when the DMC is associated with the device/user (104). Thereafter, the coupon characteristic can be fixed until redemption. At redemption, additional circumstances are determined and the

coupon characteristic adjusted, as suitable. It should be appreciated that various other suitable examples of when the initial parameter can be determined and when it can be adjusted exist, as well as under what circumstances the determination/adjustment can occur. Accordingly, the subject disclosure is not limited to the specific examples recited herein.

**[0054]** In addition to the foregoing, coupon system 102 can include a filter module 106 that can select a particular mobile device 104 for distribution of a DMC. Selection can be based on criteria associated with the mobile device 104. For instance, a location of the mobile device 104 can be utilized in determining whether to generate a DMC for such device (104). In addition, time, an ID of the mobile device (*e.g.*, subscriber identity module, mobile device calling number, or the like), an identity of a user of the mobile device, prior transaction history, prior coupon history, a user profile, sharing/trading mobile coupons with other user accounts, a DMC profile associated with a particular DMC, a manufacturer profile, a profile associated with a coupon distribution entity (102), a retailer profile, or a combination thereof or of like factors can be utilized to determine whether to generate the DMC for mobile device 104. Criteria for selecting a mobile device can be stored at coupon system 102. In addition, such criteria can be provided by a sponsor of the DMC (not depicted). Accordingly, a sponsor can provide a DMC only to those devices (104) that meet criteria identified by the sponsor.

**[0055]** Coupon system 102 can also include a valuation module 108 that establishes an initial parameter for the variable coupon characteristic of the DMC. According to one or more particular aspects of the disclosure, the initial parameter can be based on a determinable circumstance pertinent to mobile device 104. In other aspects, the initial parameter can be based on generic circumstances established by a sponsor of the DMC. The determinable circumstance can be a subset of the data utilized by the filter component 106 to select the mobile device 104, or can include additional data pertinent to the mobile device 104 (*e.g.*, information in a user profile history, such as mobile shopping history, DMC usage history, DMC redistribution information such as inter-device sharing, and so on). Valuation module 108 can collect data pertinent to the determinable circumstance, apply the data to a predetermined formula, and establish the initial parameter of the DMC variable coupon characteristic. Data can be collected at the

coupon system 102, from mobile device 104 or a network component (not depicted) associated with the coupon system 102 (*e.g.*, a back-end server, data farm, or the like), from a sponsor of the DMC (*e.g.*, a manufacturer), and so on.

**[0056]** Valuation module 108 can also continue to collect data associated with one or more determinable circumstances, and update the established initial parameter, accordingly. For instance, location of mobile device 104 can be monitored (*e.g.*, by communication with the mobile device 104 or with an associated mobile network) and the established parameter updated periodically based on location. As another example, the value can be updated based on conditions provided by a manufacturer or retail entity associated with the DMC. As a more specific example, a restaurant can offer a first discount value if the DMC is redeemed during lunch operation (*e.g.*, at a predetermined range of time) and a second discount value if the DMC is redeemed during dinner operation (*e.g.*, at a second predetermined range of time). Valuation module 108, therefore, can update a concurrent value of the DMC based on time of day and lunch and dinner hours of the restaurant. It should be appreciated that any suitable circumstance utilized to establish a value for a DMC, as described herein, can also be utilized to update the value of the DMC at a subsequent point in time (*e.g.*, upon redemption).

**[0057]** Coupon system 102 can also include a redemption module 110. Redemption module 110 can couple to a clearinghouse (not depicted) to facilitate application of a value of the DMC (*e.g.*, established by the valuation module 108) to a transaction. For instance, if mobile device 104 redeems the DMC in conjunction with a transaction identified by the DMC (*e.g.*, purchase of a hamburger at a fast food restaurant), a value established by the valuation module 108 can be applied to the transaction. Results of the transaction, including an identity of the DMC, the mobile device, a retail entity redeeming the DMC, a product/service involved, and/or value provided *via* the DMC, can be received by redemption module 110 (*e.g.*, from the retail entity facilitating the transaction). Redemption module 110 can then perform a check to determine that terms and conditions of the DMC are accurately reflected in the transaction (*e.g.*, the established value is appropriately provided to a transaction). If the transaction is appropriate, redemption module 110 can then transmit information pertaining to the DMC to the clearinghouse. The clearinghouse can perform various

mediation functions, including performing an additional check for compliance with DMC terms and conditions, indemnifying the retail entity for applying the established value to the transaction, and so on. As described, system 100 provides for a flexible electronic coupon in a mobile environment, to facilitate directed marketing at consumers based at least in part on concurrent and determinable information associated with a mobile device 104.

**[0058]** **Fig. 2** illustrates an example system 200 that distributes and redeems a DMC according to aspects of the claimed subject matter. System 200 can include a coupon system 202 that can identify a desired mobile device 204 for distribution of a DMC (212A, 212B, 212C). Coupon system 202 can select mobile device 204 based on various criteria established by a manufacturer 206 that sponsors the DMC (212A, 212B, 212C). Examples of such selection criteria can include location or identity of mobile device 204, time of day, proximity of mobile device 204 to a retailer 210, or a combination of these or like factors.

**[0059]** Once mobile device 204 is selected, coupon distributor 208 generates a DMC (212A, 212B, 212C) provided by manufacturer 206 and associates the DMC with the mobile device 204. The coupon distributor 208 can then forward the DMC (212A, 212B, 212C) to coupon system 202. Coupon system 202 then distributes the DMC (212A, 212B, 212C), or a message identifying and/or describing the DMC (212A, 212B, 212C) to mobile device 204 (*e.g.*, a short message service [SMS] message, e-mail message, text message, ad-hoc wireless data exchange, and so on). The DMC (212A, 212B, 212C) can have a variable coupon characteristic, such as redeemable value, evaluated by way of a determinable circumstance associated with the mobile device 204 and/or other components of system 200 (*e.g.*, manufacturer 206, retailer 210). Coupon distributor 208 can comprise a mobile base station, a wireless node, a stand-alone wireless device that is manually uploaded with the DMC, or any other suitable wireless communication device.

**[0060]** Determination of the variable coupon characteristic can be done at a network component (*e.g.*, coupon system 202, coupon distributor 208, etc.) or at the mobile device 204, or a combination of both. For instance, the DMC (212A, 212B, 212C) can contain instructions (*e.g.*, an executable module) directing the mobile device

204 to establish a parameter for the variable coupon characteristic and rules for doing so. In other aspects, mobile device 204 can also provide information specified by the DMC (212A, 212B, 212C) to the coupon system 202 pertinent to determining this value (*e.g.*, a GPS location of mobile device 204). In some aspects, if mobile device 204 is unable to obtain the variable coupon characteristic or initial parameter value from the coupon system 202 (*e.g.*, due to inability to establish a wireless link), an executable module included within the DMC (212A, 212B, 212C) can be utilized to calculate the value at mobile device 204.

**[0061]** The determination, as discussed above, can be conducted at various suitable times. For instance, when mobile device 204 is first selected by coupon system 202, when the DMC (212A, 212B, 212C) is generated at coupon distributor 208, when the DMC (212A, 212B, 212C), or an indication thereof, is transmitted to the mobile handset 204, at a predetermined point in time after the mobile handset 204 receives the DMC (212A, 212B, 212C), as a result of a user input (*e.g.*, recommending the DMC, forwarding the DMC to another mobile device *via* ad-hoc data exchange, or utilizing a network), based on activity of a third party (*e.g.*, a 'buddy list' member obtains, recommends, redeems or somehow interacts with the DMC), based on a threshold change in a determinable circumstance associated with the mobile device 204, or upon redemption, or a combination thereof. Accordingly, in such aspects, an initial parameter can be adjusted (*e.g.*, according to rules provided manufacturer 206) up until redemption of the DMC (212A, 212B, 212C).

**[0062]** As depicted, a DMC (212A, 212B, 212C) is transmitted to various components of system 200 as shown by the solid line arrows of **Fig. 2**. The DMC (212A, 212B, 212C) is first generated by a manufacturer or sponsor 206 of the DMC (212A, 212B, 212C). At this stage, DMC 212A can comprise a list of rules pertinent to distribution of the DMC (212A, 212B, 212C) to a mobile device 204. Rules can specify selection of a mobile device (204), identifying variable coupon characteristics of the DMC (212A, 212B, 212C), determining how to valuate those characteristics, and terms or conditions for redeeming the DMC (212A, 212B, 212C).

**[0063]** DMC 212A is received by coupon distributor 208. Coupon distributor 208 can generate an electronic file to package the DMC (212A, 212B, 212C). For instance,

the electronic file can facilitate displaying and/or playing media pertinent to a product, value, redemption information, variable coupon characteristics, or rules for evaluating/updating such characteristics, and so on, of the DMC (212A, 212B, 212C). The electronic file can be in various formats based on feedback from the mobile device 204 (*e.g.*, a pdf-type format, a word-processing format, a spreadsheet format, *etc.*).

**[0064]** Once an electronic package for the DMC (212A, 212B, 212C) is generated, and a mobile device 204 selected, DMC 212B is sent to coupon system 202. Coupon system 202, as discussed, can establish a value (*e.g.*, an initial value, or a fixed value, *etc.*) of the dynamic aspects of the DMC 212C upon transmitting the DMC 212C to mobile device 204. Alternatively, coupon system 202 can leave the dynamic aspects undefined at such time. A version of the DMC (212A, 212B, 212C) received at mobile device 204 is indicated by DMC 212C.

**[0065]** The dotted line of **Fig. 2** indicates data transmitted between components of system 200. Such data is sent to coupon system 202 and can include information pertinent to maintaining a wireless link with mobile device 204, location or identity information of the device (204), file compatibility or operating system information of the device (204) or like information. Data pertinent to generating and/or packaging a suitable DMC 212B is forwarded to coupon distributor 208 from coupon system 202. Optionally, data can be provided to manufacturer 206 indicating that a DMC has been distributed to the mobile device 204.

**[0066]** Mobile handset 204 can utilize the DMC 212C in conjunction with a transaction at a retailer 210 identified in the DMC 212C. Retailer 210 can be any suitable store, physical or virtual (*e.g.*, an online Internet vendor), that can provide a product or service identified in the DMC 212C. Mobile handset 204 transmits the DMC 212C, or unique ID of the DMC 212C, or the like, to the retailer 210 in conjunction with a suitable transaction. Retailer 210 forwards the transaction information to a clearinghouse 214 for mediation, authorization, and/or reimbursement.

**[0067]** Clearinghouse 214 can be any suitable networked entity that can provide billing and mediation for a DMC (212A, 212B, 212C). Specifically, clearinghouse 214 obtains information pertinent to a transaction from retailer 210 that involves the DMC (212A, 212B, 212C). Clearinghouse 214 can determine whether the DMC (212A, 212B,

212C) is valid, whether applying the DMC (212A, 212B, 212C) to the transaction is valid, whether the DMC (212A, 212B, 212C) is properly applied to the transaction, and so on. If the information pertinent to the transaction matches specifications for the DMC (212A, 212B, 212C), clearinghouse 214 can forward data identifying the transaction and the DMC (212A, 212B, 212C) to manufacturer 206. Manufacturer 206 can then provide reimbursement for the DCM (212A, 212B, 212C) to clearinghouse 214, which forwards at least a portion of such reimbursement to retailer 210. Accordingly, system 200 provides one example system that can generate, distribute, redeem, and indemnify various entities in conjunction with implementing a DMC (212A, 212B, 212C) in a mobile environment.

**[0068]** **Fig. 3** illustrates an example system 300 that can dynamically valuate a DMC based on determined information according to one or more aspects. System 300 can include a coupon system 302 that selects a mobile device 304 for a DMC, determines an initial parameter or value for a variable characteristic of the DMC, and facilitates redemption of the DMC, as described herein. It should be appreciated that coupon system 302 can be contained on a network (*e.g.*, a server on the Internet, a component of a mobile network, *etc.*), contained within mobile device 304, distributed across the network and the mobile device 304, or separate from the network and the mobile device 304. Accordingly, selection, DMC generation, valuation, and redemption functions of coupon system 302 should not be limited to one such component of system 300.

**[0069]** According to some aspects, system 300 can include a transaction database 306 that stores information related to a user profile, a vendor profile, a DMC profile or a retailer profiler, or a combination thereof. A user profile can provide user preferences in conjunction with a DMC (*e.g.*, indicating a desired sponsor, a desired retailer, a desired product, whether and/or what type of DMC is to be accepted at the mobile device 304, or the like). The user profile can also include prior transaction history associated with a user of the mobile device 304, including previous DMC received, cancelled, redeemed, stored on the device 304, and so on. The user profile can also indicate prior DMC transaction history, mobile shopping history, or sharing and social network history pertinent to DMCs. In some aspects, the user profile can include feature information of the mobile device 304 (*e.g.*, for determining what multi-media features associated with the DMC can

be activated). Information contained in the user profile can be utilized, at least in part, to select a mobile device (204) as a target device for DMC distribution and/or to determine a parameter of a DMC variable coupon characteristic (*e.g.* set a redeemable value), or other variable coupon characteristic of the DMC (*e.g.*, re-distribution and sharing rules, multi-media features bundled within the mobile device).

**[0070]** According to some aspects, system 300 can include a data mining module 310 to interface with various system components (302, 304) to extract information and update transaction database 306. For instance, data mining module 310 can interface with mobile device 304 and obtain information pertinent to user transaction history, saved DMCs, preferred DMCs, DMCs viewed on a user interface of mobile device 304, DMC advertisements played at the mobile device 304, and so on. Such information can be forwarded to transaction database 306 and added to the user's (304) profile, a DMC profile, vendor profile, manufacturer profile, distributor profile, and/or retailer profile associated with the DMC. In similar fashion, data mining module 310 can interface with vendor, retailer, or distributor entities or with coupon system 302 (including sub-components of such system 302) and generate/update appropriate profiles at transaction database 306. Accordingly, information stored at transaction database 306 can be continually updated based on data extracted by data mining module 310.

**[0071]** According to some aspects, a vendor profile contained within the transaction database 306 can provide various rules for generating, distributing, evaluating and/or redeeming a DMC, as specified by a sponsor of the DMC (*e.g.*, product manufacturer). Such information will be utilized by system 300 in conjunction with distributing a DMC, in conjunction with determining a value of the DMC, and/or other dynamic aspects of the DMC. A retailer profile can also be contained within the transaction database 306. The retailer profile can include information pertinent to a product or service identified in a DMC, availability of such product/service at a particular retail location, participation of such retail location in a DMC transaction, and additional terms or conditions imposed by the retailer. For instance, a retailer profile can indicate which locations will honor a DMC, current product/service availability applicable to the DMC, hours of operation, hours of redemption, any factors pertinent to determining a value of the DMC or other provided benefit (*e.g.*, a change in redeemable value at various

times of day), and the like. In addition to the foregoing, transaction database 306 can include a DMC profile that contains particular information pertinent to each DMC or type of DMC provided by a sponsor. The DMC profile can indicate special incentives included within the DMC (*e.g.*, a product advertisement, see **Fig. 4,** *infra*), and how a variable coupon characteristic of the DMC is affected by such incentives. A DMC profile can be specific to a particular product or service, particular to a manufacturer, particular to a retailer, particular to a type of mobile device, or a combination thereof.

**[0072]** As a specific example of the foregoing, various profiles can be contained in transaction database 306 that affect a DMC. As a first example, a profile of User A could indicate that User A is interested only in DMCs related to pizza restaurants or pizza in particular. Thus, system 300 can ignore a mobile device 304 associated with User A when distributing a non pizza-related DMC. A profile of Manufacturer X can specify that a DMC is to have a variable redeemable value, depending on both proximity of the mobile device 304 to a retail location, and based on the time of day. In addition, Manufacturer X's profile can indicate that a DMC should be generated once each day and that all of Manufacturer X's DMCs are to expire within 30 days of distribution to a mobile device 304. Accordingly, system 300 can generate one DMC for Manufacturer X per day (*e.g.*, calendar day), set and adjust a redeemable value of each Manufacturer X DMC based on location of a recipient mobile device (304) and time of day, and set an expiration date for such DMC(s) at 30 days from distribution to the recipient mobile device(s) (304). Likewise, similar information contained within a retailer or DMC profile can be integrated into terms, conditions, and variable coupon characteristics of a DMC.

**[0073]** System 300 can further include a learning engine 308 that employs machine learning to evaluate information contained in the transaction database 306 and make strategic determinations related to a DMC. In one aspect, learning engine 308 can employ user profile information to determine whether or what DMC is most appropriate to associate with a particular mobile device 304 (*e.g.*, based on past DMC usage history, mobile shopping history, *etc.*). In another aspect, learning engine can employ such information to evaluate a determinable circumstance associated with a mobile device 304 and establish an initial parameter of a variable coupon characteristic (*e.g.*, redeemable value, applicable media-features). Information utilized by learning engine 308 can be

referenced with respect to at least one DMC distribution or valuation rule (*e.g.*, provided by a DMC sponsor or distributor) for making the determinations (*e.g.*, distribute a particular DMC only within 30 minutes of a time period that the DMC is most likely to be redeemed).

**[0074]** Information utilized by learning engine 308 can comprise any suitable information pertinent to the mobile device 304, a DMC, or a DMC sponsor, retailer, or the like (*e.g.*, determined from an applicable profile). More specifically, such information can include time, mobile device location, distribution device location and/or retail store(s) location, user transaction or coupon history, frequent user coupon points, retailer profile information, DMC profile information, and so on. In one example, the learning engine 308 can utilize user mobile shopping history and DMC usage history to determine whether to distribute/associate the DMC with the mobile device 304, and determine an initial parameter for the variable coupon characteristic prior to such distribution/association. It should be appreciated that as data is updated at transaction database 306, the learning engine 308 can re-evaluate the information to update a state of the variable characteristic. As a particular example, if a DMC is presented for redemption, transaction module can access pertinent profile or history information to establish a final redeemable value for the DMC at time of redemption.

**[0075]** To make strategic determinations, learning engine 308 can utilize a set of models (*e.g.,* user preference model, coupon sponsor model, usage/sharing history model, etc.) in connection with determining relationships between information contained in the transaction database 306 and rules for distributing and/or valuating a DMC. The models can be based on a plurality of information (e.g., a state of a user/manufacturer DMC distribution flag, frequency of past user DMC activity, user feedback pertinent to one or more DMCs, retail availability of a product/service, general mobile shopping history or preferences, location of the mobile device 304, distance between the mobile device 304 and DMC distribution device (302) and/or a retail entity, and so on). Optimization routines associated with learning engine 308 can harness a model that is trained from previously collected data, a model that is based on a prior model that is updated with new data, *via* model mixture or a data mixing methodology, or simply one that is trained with

seed data, and thereafter tuned in real-time by training with actual field data provided by user interest vector 604.

**[0076]** In addition, learning engine 308 can employ learning and reasoning techniques in connection with making determinations or inferences regarding optimization decisions and the like. For example, learning engine 308 can employ a probabilistic-based or statistical-based approach in connection with modifying or updating data structures or data configurations pertinent to the mobile device 304, or drawing conclusions therefrom. The inferences can be based in part upon explicit training of classifier(s) (not shown) before employing the learning engine 308, or implicit training based at least upon manual input and the like. Data or policies used in optimizations can be collected from a specific database or from a community of databases (not depicted) of various types (*e.g.*, obtained by data mining module 310), various applications and/or operating systems, for instance.

**[0077]** Learning engine 308 can also employ one of numerous methodologies for learning from data and then drawing inferences from the models so constructed (*e.g.*, Hidden Markov Models (HMMs) and related prototypical dependency models, more general probabilistic graphical models, such as Bayesian networks, *e.g.*, created by one or more structure searches using a Bayesian model score or approximation, linear classifiers, such as support vector machines (SVMs), non-linear classifiers, such as methods referred to as "neural network" methodologies, fuzzy logic methodologies, and other approaches that perform data fusion, etc.) in accordance with implementing various aspects described herein. As a non-limiting example, classifiers can be trained on a relationship between a user profile preference for a particular product or service identified in a DMC, and a retail entity's availability of such product or service (and, for instance, distance from a mobile device to the retail entity), or other examples described herein. As data is updated at transaction database 306, or additional data pertinent to mobile device 304, a DMC, a DMC supplier, or retail entity, *etc.*, is identified, the classifiers can be retrained. For instance, when a DMC associated with a user profile/mobile device 304 is redeemed, data mining module 310 can update transaction database 308 with redemption information (*e.g.*, ID of DMC redeemed, product/service, value applied to the transaction, *etc.*) and learning engine 308 can execute one or more

classifiers to generate changes to inferences and results provided by the learning engine 308.

**[0078]** Methodologies employed by learning engine 308 can also include mechanisms for the capture of logical relationships such as theorem proverbs or more heuristic rule-based expert systems. Inferences derived from such learned or manually constructed models can be employed in optimization techniques, such as linear and non-linear programming, that seek to maximize some objective function. For example, manipulating data of user interest vector 604 to deconstruct such data and identify potential users associated therewith can be based on iterative interactions with the user input vector 604, common times at which particular subject matter activity occurs, common communications at which particular subject matter activity occurs, common data packets wherein particular subject matter activity occurs, and/or like factors suitable for data configuration optimization.

**[0079]** Accordingly, learning engine 308 serves as an interface to the profile information stored in the transaction database 306. Therefore, system 300 can continually determine and store information pertinent to a mobile device 304, a vendor or retailer of a DMC, and so on, to generate a current and accurate value for dynamic aspects of the DMC. Thus, according to some aspects, system 300 provides for expedient valuation of a DMC upon redemption.

**[0080]** **Fig. 4** illustrates a block diagram of a sample system 400 that integrates dynamic media into or bundles dynamic media with a DMC 410 and can valuate the DMC 410 based in part on the media. System 400 includes a coupon system 402 that can generate, distribute, valuate, and/or facilitate redemption of a DMC 410 as described herein. Further, the coupon system 402 can select a mobile device 404 to be associated with the DMC 410 based on various criteria established by a sponsor (not depicted) of the DMC 410. In addition, system 400 can obtain and incorporate media (408) with the DMC 410. Such media (408) can include advertisements, product or manufacturer information, DMC distributor information, and so on. The media (408) can be packaged into a mobile device application that can be played at a user interface 412 of the mobile device 404. In some aspects, a state of a variable coupon characteristic (*e.g.*, redeemable value) of the DMC 410 can be based in part, on whether the media (408) is played at the

mobile device 404. Alternatively, or in addition, valuation of the variable coupon characteristic can be based at least in part on employing the device to indicate the media (408) is consumed (*e.g.*, scanning a bar code of a print advertisement) or playing the media (408) on another device (*e.g.*, Internet advertisement or streaming audio advertisement containing an electronic watermark viewed on a computer,) associated with the mobile device or a user of such device (*e.g.*, *via* a common username/logon ID). Thus, added incentive can be provided to a consumer in conjunction with viewing an advertisement, and in larger scales, DMC distribution can provide a beneficial platform for advertisers and product marketing.

**[0081]** System 400 can include a media integration module 406. Media integration module 406 can receive and store various media information (408), electronic files (408), and/or audio-visual programs, *etc.* Such media (408) can include advertisements, product/service descriptions, manufacturer, retailer or distributor information, or third party information, or a combination thereof or of like information. The information (408) can be pertinent to a DMC distributed to mobile device 404, tangentially related (*e.g.*, pertaining to other products of a common manufacturer), or unrelated to the DMC 410 (*e.g.*, provided by an unrelated sponsor).

**[0082]** In addition to the foregoing, media integration module 406 can integrate media 408 within a DMC 410 or bundle media with a DMC 410 that is associated with the mobile device 404. Further, the media integration module 406 can package the DMC (or, *e.g.*, an indication of the DMC) and media into a mobile device application and transmit the application to mobile device 404. Accordingly, by accessing the DMC 410 at a user interface 412 of mobile device 404, information pertaining to the synchronized media (408) is presented or displayed. A user can then select the media 408 to view it on the mobile device 404. In some aspects, the media 408 can be automatically played on the mobile device 404 when the DMC is received, or selected, or the like.

**[0083]** According to at least one aspect, a particular mobile application can be utilized to package the media/DMC that provides various multidimensional functions to highlight feature richness of the DMC/media. For instance, the mobile device application can be configured to utilize an audio, visual, olfactory, gustatory (*e.g.*, pertaining to the sense of taste) or tactile function of a target mobile device (404). Such function can be

obtained from user profile information stored at the mobile device 404, a DMC application located on the mobile device, on a network transaction database (not depicted, but see FIG. 3, *supra*), and so on. Such functions can be employed, for instance, to augment a characteristic of a product or service associated with the DMC, or with an advertisement (*e.g.*, third party ad, manufacturer ad, retailer ad, *etc.*) bundled into the media.

**[0084]** As one example of the foregoing, a mobile device 404 could comprise tactile sensory features (*e.g.*, vibration device, tactile display) that provide tactual feedback. The tactile sensory features can be employed by a product-related application to convey tactual information to a user of the mobile device. For example, audio/video media 408 of a race car engine could be coupled with a tactile application that employs a vibration device or tactile display to give a user a representative 'feel' of the vibration caused by a powerful engine motor. A DMC associated with a high performance motor oil product could be bundled with the audio/visual/tactile media 408, which can serve as an advertisement of the product. It should be appreciated that the foregoing is simply one example of a sensory features (*e.g.*, graphical display, audio controller and speakers, vibration device, tactile display, scent replicator) of a mobile device 404 that can be utilized to augment an aspect of a product or service associated with a DMC. Other examples of device sensory features (*e.g.*, audio, visual, tactile, olfactory, gustatory, *etc.*) known in the art, or made known to one of skill in the art by way of the context provided herein, are included in the subject disclosure. Some examples can include employing olfactory features (*e.g.*, pre-loaded perfume scents coupled with a scent spray or ejector) to augment media (408) pertaining to perfumes or other scented products (*e.g.*, soaps, air fresheners). Another example can comprise media (408) employing combinations of sensory features, such as an audio/video presentation of a major league baseball World Series, coupled with device vibration coinciding with a roaring crowd and scents of buttered popcorn 'in the air'.

**[0085]** According to further aspects, media integration system 406 and/or coupon system 402 can affect a variable characteristic of the DMC 410 (*e.g.*, redeemable value) based on the media 408. According to one particular example, if the media 408 is played by mobile device 404, a redeemable value of DMC 410 can be adjusted (*e.g.*, increased).

To this purpose, DMC 410 can record information pertinent to media 408. Specifically, DMC 410 can set a flag, or like indicator, once the media 408 is presented on the user interface 412 of the mobile device. The flag or indicator can then be submitted to coupon system 402, and the coupon system 402 can adjust a dynamic value of the DMC 410 accordingly. Thus, upon redeeming the DMC 410, additional value can be provided in conjunction with a transaction. Accordingly, a user of the mobile device 404 is presented incentive to view the media (*e.g.*, advertisement) and a sponsor of the media is presented some indication that the media 408 was viewed.

**[0086]** In another aspect, the media can be an advertisement of a third party (*e.g.*, that is not a sponsor, recipient, or distributor of the DMC). If the media is played at mobile device 404, DMC 410 can update coupon system 402 as described above. Coupon system 402 can then modify, initiate or complete a transaction with the third party based on playing the advertisement at the mobile device. Thus, system 400 can provide an additional revenue stream related to distributing and/or playing third party advertisements in conjunction with distribution of a DMC and/or advertisement media to target device.

**[0087]** According to still further aspects, coupon system 402 can request input in response to playing media at the user interface 412. For instance, questions pertinent to played media can be presented at the user interface 412 during or after playing the media. A user can answer the questions *via* the user interface 412 and transmit the answers to coupon system 402 through the mobile device 404. If answers are received, it is more likely that the user viewed the media 408 and, based on the feedback or answers, the user's opinion and/or understanding of the media 408 can be ascertained. In addition, a variable characteristic of the DMC 410 can be adjusted based on the questions/feedback in response to the media 408. As an example, a redeemable value, or an additional value or benefit can be provided based on the nature of the response to the media 408. As described, system 400 provides a mechanism to integrate advertisements and other media of third party entities with a DMC, to provide benefit for consumers as well as sponsors of the media.

**[0088]** **Fig. 5** depicts a block diagram 500 of an example user interface 504 that organizes and presents information pertinent to a DMC. User interface 504 is coupled to

a mobile device 502. The mobile device 502 can receive one or more DMCs from a DMC distributor or like entity, as described herein. A representation of the DMC can include one or more features that can be defined by one or more feature representations of the DMC. The feature representations can be generated by one or more user interface devices or functions of the mobile device. For instance, one feature representation can include auditory information. Another feature representation can include graphical information. Further feature representations can include tactile or olfactory information. One or more such feature representations, separately or in combination, can comprise the representation of the DMC at the mobile device.

**[0089]** As described herein (*e.g.*, see FIG. 4, *supra*), a DMC or indication thereof transmitted to a mobile device 502 can comprise a media file or electronic application that can present information, advertisements, *etc.* at a device user interface 504 in a feature rich multi-media format. In some aspects, the media file/electronic application can be incorporated into the DMC. In other aspects, the media file/electronic application can be included with the DMC. In addition, the media file/electronic application can employ audio, visual, olfactory, gustatory, or tactile functions or a combination of such functions, of the mobile device 504 to present the media and augment one or more aspects of the DMC or an advertisement associated therewith. Accordingly, feature richness and application multidimensionality of the DMC can be provided at the mobile device 502.

**[0090]** In one aspect, representation of a DMC can include multiple dimensions, such as multiple slides or layers (506, 508, 510). Each dimension or layer (506, 508, 510) can segregate information pertinent to the DMC. For instance, a first layer 506 can provide present information pertaining to a DMC. A second layer 508 can provide prior information pertaining to previous DMCs received at the mobile device 504, for instance, that are similar to the current DMC (*e.g.*, common product, manufacturer, retailer, or the like). In addition, a third layer 510 can provide social networking information pertaining to a DMC.

**[0091]** As a particular example of social networking information, the third layer 510 can indicate a user preference (*e.g.*, contained in a user profile, generated from prior transactions, *etc.*) associated with the DMC. In addition, the third layer 510 can tabulate

preferences contained by associates of a user of mobile device 502. For instance, opinions or usage history of other individuals specified in a friends list can be shared between mobile devices (502) and stored on memory allocated to the DMC. Such information can also be obtained from social networking websites accessed by the mobile device 502. Information from identified trendsetters, statistical information pertaining to groups of individuals, and the like can be collected, stored, and displayed at the third layer 510. Thus, a user can access others' opinions and perceptions of the DMC, such as whether it provides a good value, how they liked an associated product/service, how they maximized value associated with the DMC, opinions of advertisements or other media coupled with the DMC (*e.g.*, see **Fig. 4,** *supra*), and so on.

**[0092]** In some aspects, a layer (506, 508, 510) can include terms and conditions, redemption information, additional manufacturer/retailer/distributor product or business information, or the like. Such information can be organized in various suitable ways on the user interface 504 of a mobile device 502. It should be appreciated that various suitable business and social network information pertaining to entities associated with a DMC, as described herein or known to one of skill in the art, or pertaining to a device (502) or user can be contained on various DMC display layers (506, 508, 510).

**[0093]** According to some aspects, present information associated with a DMC can be displayed on at least one layer 506. The present information can include data describing the DMC, as well as associated entities, value, incentives, and redemption information pertaining to the DMC. For instance, a first portion 512 can provide validity information, including expiration date, status, and so on. A second portion 514 can display frequent-coupon user points associated with the DMC. For instance, if a user has redeemed one or more DMCs of a particular sponsor or vendor in the past, the points can provide an indication of how many DMCs have been redeemed, and provide additional value in conjunction with future redemptions.

**[0094]** In addition to the foregoing, present information can also include brand information displayed in another portion 516 of the first layer 506. Brand information can identify a product, provide information pertinent to the product or a supplier, and so on. Further, an additional portion 518 of the first layer 506 can provide a concurrent value of the DMC. The concurrent value can be a percent discount, flat discount,

purchase-related discount (*e.g.*, buy one get a second half price), added benefit (*e.g.*, free customer service, technical support, *etc.*), or a combination thereof, as described herein or known to one of skill in the art. In addition, the concurrent value can be based on concurrent circumstances associated with the mobile device (*e.g.*, location), independent criteria (*e.g.*, time of day), relative criteria (*e.g.*, number of related DMCs redeemed by other devices 502), retailer stock, and so on. Further, according to some aspects, the value (518) can be updated in response to a user input at the user interface 504. The value (518) can be modified, if appropriate, based on a state of circumstances pertinent to the value at a time of the input. Such circumstances and modification can be conducted at the mobile device 502, at a network server (not depicted), or a combination of both.

**[0095]** Additional information can also be displayed at a present information layer 506. For instance, one portion 520 can provide information pertinent to added incentives, such as media or advertisements included with the DMC. Moreover, another portion 522 can indicate an ID of the DMC. The ID can be displayed as a bar code, a string of digits, or the like. Display of the ID can also be utilized in conjunction with redemption of the DMC (*e.g.*, a bar code displayed at the user interface 504 can be scanned by an electronic scanner at a point of service device, such as a cash register).

**[0096]** In one or more other aspects of the subject disclosure, multi-dimensional layers (506, 508, 510) can comprise different media applications pertinent to a DMC or advertisement. For instance, a first layer 506 can comprise a graphical depiction of a product associated with a DMC (*e.g.*, a picture of a pizza with a manufacturer's logo or trademark). A second layer 508 can comprise an audio/visual application that plays an animated advertisement on the user interface 504. A third layer 510 can employ a particular function/feature of the mobile device (*e.g.*, an olfactory feature comprising a scent loaded onto the mobile device 502) to augment an aspect of the product (*e.g.*, the application can cause the mobile device 502 to release a pizza scent while the audio/visual application shows a hot freshly baked pizza). Thus, the multi-dimensionality of the user interface layers is not limited to segregating information, but can be employed to display various suitable multi-dimensional media features of the DMC at the user interface of the device. It should be appreciated that various information can be included within a user interface display of a mobile coupons, and **Fig.**

5 depicts an example only. Other mechanisms for organizing and displaying information pertinent to one or more DMCs, known to one of skill in the art, are contemplated and incorporated into the subject disclosure.

[0097] **Fig. 6** illustrates a block diagram of an example system 600 for determining a current value of a variable-value DMC according to some aspects. System 600 can include a valuation module 602 that utilizes various data (608) to determine value for a DMC. It is to be appreciated that the data can be obtained at valuation module 602 at various points in time, including upon generation, transmission, and/or redemption of a DMC, as well as in response to a user input. It is further to be appreciated that valuation module 602 can reside proximate the mobile device 604, proximate a networked device (*e.g.*, a mobile service provider, or an Internet server), or a combination thereof.

[0098] Mobile device 604 can include a valuation engine 606 that extracts a factor relevant to establishing a value for the DMC from mobile device 604. The factor can be related to any suitable information pertinent to such device 604. For instance, the factor can be related to location of the device 604 (*e.g.*, determined by GPS, base station triangulation or like techniques, peer-to-peer ranging, and so on), identity the device 604 or a user of the device 604, a user profile contained at the device 604, prior DMC transaction history, DMCs stored at the mobile device 604, advertisements associated with DMCs, special manufacturer incentives, or a combination of these or like factors. Valuation engine 606 can access various software, applications, and modules of the mobile device 604 to collect data pertinent to the factor(s) to facilitate establishing a value of a DMC based on such factor(s).

[0099] Data collected by valuation engine 606 is included within a data file 610 and provided to the valuation module 602 as data 608. As described above, valuation module 602 can analyze information in the data file 610 and generate a value 612 for a DMC. A relationship between data 608 and value 612 can be based on one or more algorithms or rules provided by a sponsor of the DMC. Accordingly, terms, conditions and other limitations of the sponsor can be incorporated into the value (612) for the DMC. Valuation module 602 returns the value 612 to the mobile device 604, which can associate the value 612 with a DMC.

**[00100]** Exchange of data 608 for value 612 can be conducted at predetermined points in time (*e.g.*, periodically, based on device location or change in location, *etc.*), or based on user request. For instance, a user can press a 'value update' button, or the like, associated with a graphical display of a DMC at the mobile device 604. Such an input can initiate data collection by valuation engine 606, as described above, and submission of the data 608 to valuation module 602. In some aspects, exchange of data 608 for value 612 can be conducted at issuance of the DMC, at redemption of the DMC, or other suitable circumstances.

**[00101]** **Fig. 7** depicts a block diagram of a sample system 700 comprising a mobile handset 702 that can facilitate utilization and/or valuation of a DMC in accordance with further aspects. Specifically, mobile handset 702 can couple with a coupon system 704 that generates, issues and/or facilitates redemption of the DMC. In addition, the coupon system 704 can participate in valuation of the DMC, or in some aspects, the valuation can be performed at the mobile device 702 independent of the coupon system 704. Accordingly, value can be determined, in suitable circumstances, even where a link with the coupon system 704 is not available.

**[00102]** Mobile handset 702 includes at least one antenna 706 (*e.g.*, a transmission receiver or group of such receivers comprising an input interface) that receives a signal (*e.g.*, pertaining to voice call, data transfer, DMC value, and so on) and a receiver 708, which performs typical actions (*e.g.*, filters, amplifies, down-converts, *etc.*) on the received signal. Specifically, antenna 706 can obtain a DMC from the coupon system 704 over a wireless link between such system 704 and the mobile device 702. Antenna 706 can also be involved in data exchange with coupon system 704 related to determining a value or other variable coupon characteristic of the DMC, determining a location or distance between the mobile handset 702 and coupon system 704, or the like. For instance, a valuation engine 716 can collect data pertinent to dynamic circumstances associated with the mobile device 702 (*e.g.*, location, DMCs stored, prior transaction history, *etc.*). The information can be based on a query for information provided by coupon system 704, based on instructions stored at memory 714, or dynamically established at least in part by the coupon system 704 and mobile device 702, or a combination thereof.

**[00103]** Antenna 706 and receiver 708 can also be coupled with a demodulator 710 that can demodulate received symbols and provide them to a processor 712 for evaluation. Processor 712 can analyze information received by antenna 706 or a user input interface 720 of the mobile device 702, and/or generate information for transmission by a transmitter 726. Additionally, processor 712 can control and/or reference one or more components (706, 708, 710, 714, 716, 718, 720, 722, 724, 726, 728) of the mobile handset 702. Additionally, processor 712 can execute one or more modules, applications, engines, or the like (716, 718, 722, 724) that comprise information or controls pertinent to determining variable coupon characteristics of a DMC, factors for evaluating such characteristics, displaying such information at a user interface 720, or the like. Alternatively, or in addition, such modules (716, 718, 722, 724) can comprise information or controls pertaining to receiving and/or redeeming a DMC, as described herein.

**[00104]** Mobile handset 702 can additionally include memory 714 that is operatively coupled to processor 712. Memory 714 can store data to be transmitted, received, and the like. Such data can be pertinent to determining/verifying a variable coupon characteristic of a DMC. Alternatively, or in addition, the data can be pertinent to playing a media file associated with a DMC at a user interface 720 of mobile handset 702. In at least one aspect, memory 714 can store a DMC received at the mobile handset 702, as well as one or more factors, rules, *etc.*, for determining and/or updating an initial parameter of a variable DMC characteristic.

**[00105]** Memory 714 can also be coupled with valuation engine 716 that can extract data from the mobile handset 702 in conjunction with determining a value of a DMC. According to some aspects, the valuation engine 716 can calculate a value (or, *e.g.*, a state or parameter of another variable coupon characteristic) of the DMC based at least in part on the collected data. According to another aspect, the valuation engine 716 can send the collected data (*e.g.*, *via* processor 712, modulator 726, and transmitter 728) to the coupon system 704 to calculate the value (or, *e.g.*, other variable characteristic).

**[00106]** According to additional aspects, data collected by valuation engine 716 can include time, location of the mobile device 702, a user input provided at the mobile device 702, location of a vendor or retailer associated with a DMC, or a combination of

these or like data. According to one or more other aspects, the valuation engine 716 can obtain an adjustment to a default or prior determined DMC characteristic or value based at least in part on additional data pertinent to such value. According to still other aspects, valuation engine 716 can freeze the value of the DMC based at least in part on the collected data, or a user input, or based on redemption of the DMC. According to still other aspects, valuation engine 716 can enable the value/characteristic to be re-evaluated by the mobile device 716 as data pertinent to determining such value/characteristic changes.

**[00107]** Memory 716 can also be coupled to a playback module 718 that can present information pertinent to the DMC at the mobile device 702. As an example, such information can include product description, supplier information, manufacturer information, retailer information, vendor information, redemption instructions, expiration information, DMC identification information, or value-added incentives (*e.g.*, advertisements) associated with the DMC (*e.g.*, see **Fig. 5**, *supra*). Playback module 718 can comprise suitable user interface modules to present the information pertinent to the DMC. For instance, the playback module 718 can include an audio/visual module that plays audio and/or video files configured for mobile device 702. Further, the playback module 718 can include a tactile module that utilizes a tactile function of mobile device 702 to provide tactile-related information pertinent to the DMC. According to some aspects, the playback module 718 can include an olfactory or gustatory module that utilizes suitable functions of mobile device 702 to provide smell or taste-related information pertinent to the DMC (*e.g.*, scents stored on the mobile device 702 representative of a product associated with the DMC). Further, memory 716 can be coupled with a user interface 720 that can be coupled to playback module 718 for graphical, auditory, textual, and/or olfactory presentation of information, as suitable. The user interface 720 can also play a media file, advertisements, or the like, coupled to the DMC. Such media file can identify a product and concurrent redeemable value associated with the DMC, as well as applicable terms and/or limitations. The media file can further include advertisement data pertinent to the product, a sponsor of the DMC, related products, and so on, as described herein.

**[00108]** Memory 716 is also connected to an update module 722 that obtains a dynamic update to an algorithm that changes a manner in which the value for the DMC is generated. For instance, a DMC supplier can provide the dynamic update as an Internet download. Alternatively, the update can be pushed to the mobile device 702 by a mobile network (not depicted), or pulled from a mobile network (not depicted).

**[00109]** In addition to the foregoing, memory 716 can also be coupled with a redemption module 724. Redemption module 724 can collect information pertinent to the DMC, and concurrent characteristics of the DMC established by mobile device 702 and/or coupon system 704, and present such information to a point of sale device (*e.g.*, an electronic cash register, etc.) in conjunction with a commercial transaction. The redemption module 724 can also verify that a value of the DMC is properly applied to the commercial transaction. In addition, redemption module 724 can forward results of the transaction to coupon system 704 (or, *e.g.*, a clearinghouse) for mediation and billing (*e.g.*, as a verification of similar results provided by the point of sale device). The redemption module 724 can facilitate submitting a DMC to a point of sale device, for instance, in conjunction with redeeming the DMC in a transaction. As non-limiting examples, the redemption module 724 can display an ID of the DMC on a device (*e.g.*, to be read by a retail store operator, or provided by such operator by a user of mobile device 702), display a bar code or other indicia representing an ID of the DMC that can be scanned at a point of sale device, form a wired and/or wireless link to the point of sale device and submit the DMC ID to such device, couple directly with a back-end network entity (*e.g.*, a network clearinghouse module) *via* a mobile network, or a combination thereof or of the like.

**[00110]** It should be appreciated that redemption of a dynamic mobile coupon in conjunction with a transaction can be implemented in other ways, in addition to those recited above. For instance, where a DMC is stored in memory 716, the DMC can be accessed from memory 716 based on a UI input associated with redemption of the DMC and output to a user and/or a POS device. Where the DMC is stored at a network server (*e.g.*, short message server, text message server, Internet data server, Intranet data server, and so forth), the DMC, or indicia identifying the DMC can be obtained from such server based on the UI input, and output to the user and/or POS device. It should also be

appreciated that the DMC and/or indicia identifying the DMC can be input into the POS device in various ways disclosed herein and/or known in the art (*e.g.*, manually by reading the identifying information from a screen and providing such information to a clerk who enters it into the POS device, by optically scanning indicia identifying the DMC displayed on a UI of the device 702 into the POS device, through wired and/or wireless data exchange between the mobile device 702 and POS device, *etc.*). Furthermore, the indicia identifying the DMC can include a bar code or other graphical indicia, quantitative indicia (*e.g.*, unique or semi-unique number), qualitative indicia (*e.g.*, manufacturer description, product description, retailer description, and an identifier, or a combination thereof), *etc.* Furthermore, the DMC can be identified based on association with a user account (*e.g.*, maintained on mobile device 702). Information identifying the user account (*e.g.*, a phone number of the mobile device 702) can be entered into the POS device as described herein, and DMCs associated with the user account and pertinent to a transaction facilitated by the POS device (*e.g.*, where a product/service associated with the DMC is involved in the transaction) can be accessed by such device (*e.g.*, by manual input, direct communication with the mobile device 702, access to a network server). In addition to the foregoing, user loyalty cards (*e.g.*, commercial loyalty cards provided by an entity associated with the POS device, such as a retail store, online store, or the like) associated with the user account can be accessed and applied to the transaction, as provided by rules associated with such user loyalty cards. In at least one aspect of the subject disclosure, the user account can be accessed by providing user loyalty card information or payment card information coupled with the mobile device 702 or a user account associated with the mobile device (*e.g.*, through near field communication [NFC] or Felica phones where payment ID is stored on mobile device 702 and transferred to the POS device, through a one-time payment code accessed by the mobile device 702 from a network server, such as short message server or the like, and provided to the POS device, where the network server receives subsequent DMC redemption requests coupled with the payment code and can identify the user account, DMC(s), and/or payment/loyalty cards associated with such payment code to facilitate verifying and/or implementing a transaction). In at least one aspect of the subject disclosure, a personal computer or other computing device (*e.g.*, laptop, PDA, *etc.*) can

be substituted for mobile device 702 and utilize wired and/or wireless communication with remote devices to implement aspects of the disclosure provided herein.

**[00111]** Mobile handset 702 still further comprises a modulator 724, and a transmitter 726 that transmits generated signals (*e.g.*, by processor 712 and modulator 724) to, for instance, coupon system 704, a base station, an access point, another access terminal, a remote agent, a point of sale device, *etc.* Although depicted as being separate from the processor 712, it is to be appreciated that valuation engine 716 can be part of processor 712 or a number of processors (not shown).

**[00112]** The aforementioned systems have been described with respect to interaction between several components, modules, and/or electronic interface functions. It should be appreciated that such systems and components/modules/functions can include those components or sub-components specified therein, some of the specified components or sub-components, and/or additional components. For example, a system could include coupon system 102, mobile device 104, transaction database 306, transaction module 308, and valuation module 602, or a different combination of these and other components. Sub-components could also be implemented as components communicatively coupled to other components rather than included within parent components. Additionally, it should be noted that one or more components could be combined into a single component providing aggregate functionality. For instance, data mining module 310 can include transaction database 306, or *vice* versa, to facilitate collecting and storing data pertinent to various user or supplier profiles or histories by way of a single component. The components may also interact with one or more other components not specifically described herein but known by those of skill in the art.

**[00113]** Furthermore, various portions of the disclosed systems can include or consist of artificial intelligence or knowledge or rule based components, sub-components, processes, means, methodologies, or mechanisms (*e.g.*, support vector machines, neural networks, expert systems, Bayesian belief networks, fuzzy logic, data fusion engines, classifiers…). Such components, *inter alia*, and in addition to that already described herein, can automate certain mechanisms or processes performed thereby to make portions of the systems more adaptive as well as efficient and intelligent.

**[00114]** It is to be understood that the aspects described herein can be implemented in hardware, software, firmware, middleware, microcode, or any combination thereof. For a hardware implementation, the processing units can be implemented within one or more ASICs, DSPs, digital signal processing devices (DSPDs), programmable logic devices (PLDs), field programmable gate arrays (FPGAs), processors, controllers, micro-controllers, microprocessors, other electronic units designed to perform the functions described herein, or a combination thereof.

**[00115]** When the aspects are implemented in software, firmware, middleware or microcode, program code or code segments, they can be stored in a machine-readable medium, such as a storage component. A code segment can represent a procedure, a function, a subprogram, a program, a routine, a subroutine, a module, a software package, a class, or any combination of instructions, data structures, or program statements. A code segment can be coupled to another code segment or a hardware circuit by passing and/or receiving information, data, arguments, parameters, or memory contents. Information, arguments, parameters, data, *etc.* can be passed, forwarded, or transmitted using any suitable means including memory sharing, message passing, token passing, network transmission, *etc.*

**[00116]** For a software implementation, the techniques described herein can be implemented with modules (*e.g.*, procedures, functions, and so on) that perform the functions described herein. The software codes can be stored in memory units and executed by processors. The memory unit can be implemented within the processor or external to the processor, in which case it can be communicatively coupled to the processor via various means as is known in the art.

**[00117]** Referring to **Figs. 8-11**, methodologies relating to providing a DMC in a mobile environment are provided, according to one or more aspects. While, for purposes of simplicity of explanation, the methodologies are shown and described as a series of acts, it is to be understood and appreciated that the methodologies are not limited by the order of acts. For example, in accordance with one or more aspects, some acts can occur in different orders and/or concurrently with other acts from that shown and described herein. In addition, those skilled in the art will understand and appreciate that a methodology could alternatively be represented as a series of interrelated states or events,

such as in a state diagram. Moreover, not all illustrated acts are necessarily required to implement a methodology in accordance with one or more aspects.

**[00118]** **Fig. 8** illustrates a flowchart of a sample methodology 800 for providing variable value DMCs in a mobile environment. At 802, method 800 can identify a mobile device according to predetermined criteria. Identification can involve, at least in part, transmitting at least one signal to the mobile device or receiving at least one signal from the mobile device. Further, the mobile device can be identified based on the predetermined criteria, which can be provided by a sponsor of a DMC. For instance, such criteria can include a location of the mobile device, a time of day, an ID of the mobile device, prior interaction with the mobile device, user, DMC sponsor, retailer, and/or distributor profile information, including DMC usage history, mobile shopping history and the like, or a combination of these or like circumstances. Accordingly, identification of the mobile device relates to one or more qualifications provided by a DMC sponsor, determined at least in part based on wireless communication with the mobile device.

**[00119]** At 804, method 800 can associate a DMC with the mobile device, where the DMC has at least one variable coupon characteristic. The variable coupon characteristic can vary as a function of one or more determinable circumstances pertinent to the mobile device. Such circumstances can include location of the mobile device, distance to a predetermined entity (*e.g.*, a retail store), time, user profile information, vendor profile information, DMC profile information, retailer profile information, previous DMCs distributed to/utilized by the mobile device, DMCs stored at the mobile device, prior redemption of DMCs associated with the mobile device, and so on. Information pertaining to the determinable circumstances can be obtained from the mobile device, an entity communicatively coupled with the mobile device (*e.g.*, a base station, wireless transmitter), or a server of a network entity (*e.g.*, a mobile network server maintained by a service provider associated with the mobile device). The variable characteristic can include a redeemable value, applicable transactions or products/services associated with such transactions, time of redemption, location of redemption (*e.g.*, a predetermined store or online website), additional media provided

with the DMC, various feature richness associated with the DMC or media, or a combination of these or like characteristics.

**[00120]** At 806, method 800 can establish an initial parameter of the variable coupon characteristic based at least in part on at least one determinable circumstance pertinent to the mobile device. Such circumstances and their applicability to the variable coupon characteristic and/or initial parameter can be established by rules of a sponsor of the DMC. According to some aspects, establishing the initial parameter can render the value constant, independent of additional determinable characteristics described above or changes in such characteristics. According to other aspects, establishing the initial parameter can render the value constant until a predetermined circumstance occurs, in which case the value can change again (*e.g.*, a cancellation can occur rendering the value zero). Such predetermined circumstance can comprise associating the DMC with a target mobile device, receiving a value acceptance input from the target mobile device, identifying a threshold change in a determinable circumstance utilized to establish the initial parameter (or, *e.g.*, a related determinable circumstance described above), and/or receiving notice that the DMC is presented for redemption, or a combination of these or like factors.

**[00121]** At 808, method 800 can communicatively couple with a clearinghouse server to redeem the DMC in conjunction with a transaction. Further, the clearinghouse can facilitate modifying a default characteristic of the transaction based on a state of the variable coupon characteristic (*e.g.*, a current redeemable value). In general, the clearinghouse can provide billing, mediation, authorization, and/or security functions for the transaction. For instance, the clearinghouse can analyze information pertinent to the transaction and DMC and determine whether the DMC and transaction are appropriate. Further, the clearinghouse can update a manufacturer as to redemption status of the DMC. According to other aspects, the clearinghouse can cancel the DMC upon redemption (or, *e.g.*, upon expiration of an active data) to mitigate unauthorized additional redemption.

**[00122]** According to further aspects, the clearinghouse can act as an intermediary between a sponsor of the DMC and a retail entity that redeems the DMC. Specifically, the clearinghouse can relay transaction information to the sponsor and can provide

indemnification/reimbursement to the retail entity or other sponsor of the transaction a modified default characteristic of the transaction (*e.g.*, resulting from application of the DMC to the transaction). Accordingly, methodology 800 provides for targeting a DMC based on individual characteristics of a mobile device, and providing flexible characteristics, such as redeemable value, based on predetermined sponsor criteria.

**[00123]** **Fig. 9** depicts a flowchart of an example methodology 900 for distributing, evaluating, and redeeming variable value DMCs in accordance with some aspects. At 902, method 900 can receive a DMC from a manufacturer or other sponsor of the DMC. At 904, method 900 can receive a list of rules pertinent to applying the DMC to a mobile device. Specifically, the rules can provide for identifying a suitable device as a target device for DMC distribution, establishing circumstances for valuating one or more variable coupon characteristics of the DMC (*e.g.*, evaluating determinable circumstances of a mobile device to establish an initial parameter of the variable characteristic), and redemption of the DMC.

**[00124]** At 906, method 900 can identify a suitable device in accordance with the list of rules received at reference number 904. At 908, method 900 can generate a DMC application, playable at the identified device, according to the list of rules. At 910, method 900 determines whether an advertisement is to be coupled with the DMC. Such determination can be based on the identified device, on the rules provided by the manufacturer/sponsor, or like circumstances. If an advertisement is to be coupled with the DMC, method 900 proceeds to reference number 912, if not, method 900 can proceed to reference number 918.

**[00125]** At 912, method 900 can obtain an advertisement to be coupled with the DMC. The advertisement can include various information pertaining to the DMC, including sponsor information, redemption information, product or service information and/or related products or services (*e.g.*, offered by the sponsor or a retail entity). According to some aspects, a third party can provide the advertisement instead of or in addition to the sponsor, retailer, etc. At 914, method 900 can generate an advertisement media file that can be played on a user interface of the device identified at reference number 906. At 916, the media file is combined or bundled with the DMC (or, *e.g.*, an

indication of the DMC), packaged into a suitable mobile device application playable at the identified mobile device, and transmitted to the identified device.

**[00126]** In some aspects, the mobile device application can be selected to utilize an audio, visual, olfactory, or tactile function of the target mobile device. Further, the application can be configured to employ such function of the identified mobile device to augment a product, service or other aspect of the DMC or advertisement. It should be appreciated that where the advertisement is of a third party (*e.g.*, that is not a sponsor, recipient or distributor of the DMC), an indication that the third party advertisement is played at the mobile device can form the basis for modifying, initiating or completing a transaction with the third party. Accordingly, bundling advertisements of third parties can provide an additional revenue stream in conjunction with distributing a DMC.

**[00127]** At 918, method 900 can determine whether a redeemable value (or, *e.g.*, other suitable variable coupon characteristic of the DMC) is determined at the identified mobile device or at a server device. If the redeemable value is determined at the server device, method 900 can proceed to 924. If, on the other hand, the redeemable value is determined at the mobile device, method 900 can proceed to 920.

**[00128]** At 920, valuation factors pertinent to determining the redeemable value (or other suitable variable coupon characteristic of the DMC) are obtained. Such factors can include, for instance, location of the mobile device, time of day, user, sponsor or retailer profile information, whether media, advertisements or other special incentives were viewed at a mobile device, as described herein, or a combination of these or like factors. At 922, method 900 can combine the factors and valuation data with the DMC for distribution to the identified mobile device.

**[00129]** At 924, method 900 can identify valuation factors pertinent to determining the variable coupon characteristic of the DMC (*e.g.*, if not done at reference number 920). At 926, the DMC can be transmitted to the identified mobile device. Confirmation of receipt of the DMC can also be obtained and stored for reference. At 928, data pertinent to the factors determining the variable coupon characteristic can be obtained. Such data can be obtained from the mobile device, determined from data exchange with such device, or data exchange with an external entity (*e.g.*, base station of a mobile network). At 930, the value of the DMC, or other variable coupon characteristic, can be fixed based

on the data obtained at reference number 928. Fixing the value can be permanent, or can be dependent upon occurrence of some predetermined circumstance (*e.g.*, obtaining additional data pertinent to the mobile device, redeeming the DMC, *etc.*).

**[00130]** At 932, a determination is made as to whether the DMC has been submitted for redemption. If no redemption has been determined, method 900 can proceed to 934 where additional data pertinent to the factor(s) establishing the dynamic value can be obtained and/or monitored. Method 900 can then proceed back to 930 to determine whether the value or variable coupon characteristic should again be fixed based on any additional data obtained at reference number 934. If, at reference number 932, the DMC has been submitted for redemption, method 900 can proceed to 936 where the DMC is identified and cross-referenced with rules for redemption obtained at reference number 904.

**[00131]** At 938, method 900 can identify a value (or, *e.g.*, other suitable variable coupon characteristic) of the DMC. The value can be previously determined (*e.g.*, at reference number 930) or updated based on information obtained in conjunction with redemption. At 940, method 900 can check security measures associated with the DMC. Such measures can include checking proper encryption or security information associated with the DMC, determining whether the DMC has been previously redeemed, determining whether a redeeming entity is authorized to redeem the DMC, and so on. Based on such information, method 900 can apply or authorize application of the DMC to a transaction, and modify a default characteristic of the transaction based on the value (or, *e.g.*, other suitable variable coupon characteristic).

**[00132]** At 942, method 900 can submit details of the redemption and an associated transaction to a clearinghouse for mediation and billing. AT 944, method 900 can receive information from the clearinghouse. If the information approves the transaction, redemption of the DMC can be authorized. According to further aspects, indemnification/reimbursement of a sponsor of the transaction provided by the clearinghouse can be forwarded to such sponsor (*e.g.*, an entity honoring the DMC). At reference number 946, method 900 can end.

**[00133]** As described, method 900 provides a flexible mechanism to distribute a DMC in a mobile environment based on criteria established by a sponsor of the DMC. In

such a manner, the DMC can be targeted toward a particular mobile device, rather than limited to a general mass mailing. Further, the DMC can be associated with rich and dynamic media and advertisements presented at a graphical display of the mobile device. In addition, characteristics of the DMC can be dynamically adjusted, including a redemption value, to facilitate increasing or decreasing consumer-purchasing incentive. Accordingly, many benefits are provided by distribution of DMCs in a mobile environment as described by the aspects presented herein.

**[00134]** **Fig. 10** illustrates a flowchart of an example methodology 1000 for facilitating use of a DMC in a mobile environment. At 1002, method 1000 can obtain data pertinent to distribution of a DMC to a mobile device. The data can include suitable transaction specifications or recommendations associated with distribution of the DMC, if any. In addition, the data can include one or more queries for information, wherein distribution of the DMC is conditioned at least in part on responding to the query or queries. The queries can include a unique identity of the mobile device, an identity of a user of the device, a location of the device, user profile information stored at the device, and so on, as described herein.

**[00135]** At 1004, method 1000 can receive the DMC or an indication of the DMC, where the DMC has at least one variable coupon characteristic. Receiving the DMC can be based in part on, for instance, proper response to a query at reference number 1002. The DMC can include a stand-alone file or application that can operate on a mobile device. The stand-alone file can be displayed on a user interface of the device to provide information to a user and present feature richness and/or multi-dimensional aspects of the DMC. In addition, the stand-alone file can obtain and or utilize information to determine a value of the DMC. According to further aspects, the stand-alone file can facilitate redemption of the DMC at a retail entity. For instance, the file can obtain an identity of the DMC, and pertinent security, applicability, redemption value, and like information associated with redeeming the DMC. Accordingly, dynamic functions of the DMC can be performed, at least in part, at the mobile device receiving the DMC.

**[00136]** At 1006, a factor can be obtained that is pertinent to establishing an initial parameter for the variable coupon characteristic. The factor can include any suitable information pertaining to the mobile device, a product, service, manufacturer/sponsor,

distributor or retailer associated with the DMC, or the like, as described herein. At 1008, data associated with the factor can be collected to facilitate establishing the initial parameter of the variable coupon characteristic (*e.g.*, redemption value of the DMC). In one aspect, the data can be analyzed and the parameter determined at the mobile device. In other aspects, the data can be forwarded to a network device (*e.g.*, Internet server, component of a mobile operator's network) for determination of the initial parameter. The initial parameter can be fixed to mitigate change to the variable coupon characteristic based on input at the mobile device, or can be un-fixed, and thus re-evaluated to update the initial parameter. Such re-evaluation can be based on association of the DMC with the mobile device, a threshold change in the circumstance(s) utilized to determine the initial parameter or related circumstances, redemption of the DMC or an input at the mobile device (*e.g.*, an acceptance of the value), or a combination thereof or of the like. As described, method 1000 provides for receiving and interacting with a DMC to determine variable coupon characteristics of the DMC. The variable coupon characteristics can be based on information at a receiving device, and thus can be at least partially independent of an issuing or redeeming device, providing autonomy and flexibility for the DMC.

**[00137]** **Fig. 11** depicts a flowchart of an example methodology 1100 for facilitating valuation and redemption of variable value DMCs in a mobile environment. At 1102, method 1100 can receive a DMC. The DMC can be received over a wireless and/or wired link with a DMC distribution entity (*e.g.*, a component of a mobile network). At 1104, a factor is identified that is pertinent to determining a value of the DMC. The factor can include position of a recipient device, time, user profile information, user transaction history information, stored DMC information, retailer profile information (*e.g.*, including current stock of an item identified in the DMC), vendor profile information (*e.g.*, including a number of other redeemed DMCs, expiration information associated with the DMC), and like information.

**[00138]** At 1106, data pertinent to the factor identified at reference number 1104 is collected. At 1108, a determination is made as to whether the value of the DMC is calculated locally at a device or at a remote device. If the determination is made locally, method 1100 can proceed to 1112 where the value of the DMC is calculated based at

least in part on the data collected at reference number 1106. After calculating the value, method 1100 can proceed to 1114.

**[00139]** If, at reference number 1108, the value is determined to be calculated at a remote device, method 1100 proceeds to 1110 and transmits collected data to the remote device (*e.g.*, an Internet server) for calculation. The calculated value is received from the remote device, and method 1100 can proceed to 1114. At 1114, method 1100 can determine a value of the DMC based on remote device feedback or local calculations. At 1116, additional data pertaining to the factor is optionally monitored and/or collected. At 1118, the value is optionally updated based on additional data determined at reference number 1116.

**[00140]** At 1120, media associated with the DMC can be played at a recipient device. The media can describe transactions or products applicable to the DMC, retail locations participating in such transactions, redemption limitations or conditions, methods to update and/or increase the value of the DMC, and so on. At 1122, method 1100 can optionally play advertisements or incentive media included with the DMC, and update the value of the DMC as specified by the DMC. At 1124, method 1100 can submit the DMC for redemption in conjunction with a predetermined transaction at a participating retail entity. As described, method 1100 provides a process for receiving and determining value associated with a DMC based on criteria pertinent to a recipient mobile device. Accordingly, method 1100 depicts a flexible process that enables utilization and redemption of a DMC with minimal interaction with remote server devices.

**[00141]** **Figs. 12** and **13** depict block diagrams of example systems 1200 and 1300 that respectively provide and facilitate valuation of variable value DMCs in a mobile environment. Referring initially to **Fig. 12**, a system 1200 is depicted that can issue a DMC in a mobile environment. System 1200 can include an optional module, module 1202, for identifying a mobile device based on one or more predetermined criteria. The predetermined criteria can be established, for instance, by a sponsor of the DMC. System 1200 includes a module 1204 for associating the DMC to a mobile device, wherein the DMC has at least one variable coupon characteristic. Module 1204 can base distribution of the DMC on the identification performed by the first module 1202. Specifically, if the

first module 1202 determines that a mobile device matches specified criteria, the second module 1204 can distribute the DMC to the identified device. In other aspects, distribution can be based on data mined from the mobile device, such as user profile information, including DMC usage history, mobile shopping history, redistribution or social network sharing of DMCs, or the like. Such data can be compared with one or more criteria provided by a sponsor, manufacturer, distributor, and/or retailer associated with the DMC.

**[00142]** In addition to the foregoing, system 1200 further includes a module 1306 for establishing an initial parameter of the variable coupon characteristic. The initial parameter can be established at least in part on one or more factors associated with a recipient mobile device, as described herein. The mobile device can collect data pertinent to the factor(s) and provide such data to the third module 1306 for further analysis. Specifically, such data can be applied to one or more algorithms or functions provided to establish the initial parameter (*e.g.*, an initial redeemable value) of the DMC based on the one or more factors. In accordance with some aspects of the subject disclosure, system 1200 can optionally include a module 1208 for coupling with a clearinghouse. Such a clearinghouse can provide mediation and billing functions in conjunction with redeeming the DMC.

**[00143]** As an example of the foregoing, optional module 1208 can provide transaction, security, authorization, or ID information, or the like, associated with the DMC, to the clearinghouse upon redemption of the DMC. If the transaction complies with applicable specifications (*e.g.*, established by a sponsor of the DMC), the clearinghouse will provide indemnification for a retail entity honoring the DMC in conjunction with a commercial transaction. Accordingly, a user of a recipient device can utilize the DMC similar to an electronic credit card transaction in a mobile environment. Although various differences can remain, such as presentation of the DMC and associated information at the recipient device, at least in some aspects redemption, authorization, and/or indemnification of value by the clearinghouse can be performed electronically, without involving the device user.

**[00144]** Referring now to **Fig. 13**, a system 1300 is depicted that can facilitate utilization of one or more DMCs in a mobile environment. According to some aspects,

system 1300 can include an optional module 1302 for obtaining data over a wireless link. The data can relate to qualifications for receiving a DMC, for instance. For example, an identity of a recipient device, previous transaction history associated with the device, location of the device, *etc.*, can be conveyed to the module 1302 as part of the data. Information provided by module 1302 can be analyzed at a distribution device (not depicted) to determine whether the recipient device qualifies for the DMC.

**[00145]** System 1300 includes a module 1304 for obtaining a DMC or an indication of the DMC (*e.g.*, that identifies the DMC, or a product, service, or source of such product/service, rules for redemption, rules for determining a dynamic characteristic such as value, and so on), wherein the DMC includes at least one variable coupon characteristic. The DMC can comprise, for instance, a file or application, including applicable rules, terms and conditions for redemption, valuation formulae, associated advertisements and media, and the like as described herein. The DMC can be displayed at a user interface of the recipient device to convey applicable information. System 1300 can additionally include a module 1306 for obtaining a factor pertinent to establishing an initial parameter of the variable coupon characteristic. Such factor can be extracted from the DMC, or obtained from an entity that distributes the DMC to the recipient device. In addition to the foregoing, system 1300 can include a module 1308 for collecting data pertinent to establishing the value of the DMC. Accordingly, value can be established according to certain rules and based on certain circumstances of the recipient device. System 1300 can facilitate determination of the value at such device, reducing need for interactions with remote devices. According to some aspects, data collected by the module 1308 can be provided to a remote device for analysis, and such remote device can then distribute the value to the optional module 1302.

**[00146]** What has been described above includes examples of one or more aspects. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the aforementioned aspects, but one of ordinary skill in the art may recognize that many further combinations and permutations of various aspects are possible. Accordingly, the described aspects are intended to embrace all such alterations, modifications, and variations that fall within the scope of the appended claims. Furthermore, to the extent that the term "includes" is used in either the detailed

description or the claims, such term is intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim.

## CLAIMS

What is claimed is:

1. A method of remote communication, comprising:

associating a dynamic mobile coupon (DMC) with a target mobile device, wherein the DMC has at least one variable coupon characteristic; and

establishing an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device.

2. The method of claim 1, further comprising at least one of:

transmitting the DMC to the target mobile device; or

transmitting an indication of the DMC to the target mobile device that identifies a sponsor or a transaction associated with the DMC and further identifies at least one of:

the initial parameter for the variable coupon characteristic; or

a state of the variable coupon characteristic.

3. The method of claim 1, further comprising evaluating the determinable circumstance and establishing the initial parameter prior to or contemporaneous with associating the DMC with the target mobile device.

4. The method of claim 3, further comprising employing a learning engine that examines a profile history of the target mobile device and a DMC distribution rule for evaluating the determinable circumstance.

5. The method of claim 4, further comprising employing a DMC usage history, a mobile shopping history or a DMC sharing history associated with the profile history to evaluate the determinable circumstance.

6. The method of claim 3, further comprising at least one of:

securing the established initial parameter to mitigate changes to the parameter by input from the target mobile device; or

enabling re-evaluation of the initial parameter based at least in part on an input from the target mobile device.

7. The method of claim 1, further comprising establishing the initial parameter after associating the DMC with the target mobile device.

8. The method of claim 1, further comprising re-establishing the initial parameter after associating the DMC with the target mobile device based in part on at least one of:

a change in the determinable circumstance; or

an input at the target mobile device.

9 The method of claim 1, further comprising:

initiating or responding to wireless data exchange with a mobile device;

mining data pertaining to the mobile device;

comparing the mined data to one or more criteria for identifying the target mobile device; and

establishing the mobile device as the target mobile device based on a result of the comparison.

10. The method of claim 9, further comprising employing a location, time, device capability, user interface function, or identity information associated with the mobile device as the one or more criteria.

11. The method of claim 1, further comprising applying or authorizing application of the DMC to a transaction and modifying a default characteristic of the transaction based on the variable coupon characteristic.

12. The method of claim 11, further comprising communicatively coupling with a clearinghouse server and reimbursing a sponsor of the transaction based at least in part on the modified default characteristic.

13. The method of claim 1, further comprising receiving notice that the DMC is presented for redemption at a point of sale location associated with the DMC.

14. The method of claim 1, further comprising applying or authorizing application of a value to a transaction upon redemption of the DMC based at least in part on a determination of the variable coupon characteristic.

15. The method of claim 1, further comprising employing redemption value as the variable coupon characteristic and evaluating the determinable circumstance to establish the redemption value based on at least one of:

the associating the DMC with the target mobile device;

receiving a value acceptance from the target mobile device;

identifying a threshold change in the determinable circumstance; or

receiving notice that the DMC is presented for redemption.

16. The method of claim 1, further comprising employing a location of the target mobile device, feature of the target mobile device, time, user profile information, vendor profile information, DMC profile information or retailer profile information as the determinable circumstance.

17. The method of claim 2, further comprising at least one of:

bundling media with the DMC, packaging at least the media into a mobile device application and transmitting the application to the target mobile device; or

integrating media into the DMC, packaging the integrated DMC into the application and transmitting the application to the target mobile device.

18. The method of claim 17, further comprising employing an application that utilizes an audio, visual, olfactory, or tactile function as the mobile device application.

19. The method of claim 18, further comprising configuring the application to employ the audio, visual, olfactory, or tactile function to augment a characteristic of a product or service.

20. The method of claim 17, further comprising including with the media a product, service, supplier or retailer advertisement pertinent to the DMC.

21. The method of claim 17, further comprising including with the media an advertisement of a third party other than a sponsor, recipient or distributor of the DMC.

22. The method of claim 21, further comprising obtaining an indication that the advertisement is played at a recipient device and modifying, initiating or completing a transaction with the third party based on the indication.

23. The method of claim 2, further comprising transmitting an executable module with the DMC or the indication of the DMC, the executable module being configured to evaluate the determinable circumstance and establish or modify the initial parameter.

24. The method of claim 23, further comprising configuring the executable module to transmit the established or modified initial parameter to a DMC management server.

25. The method of claim 23, further comprising configuring the executable module to evaluate the determinable circumstance based on at least one of:

the associating the DMC with the target mobile device;

a threshold change in the determinable circumstance;

an input at the target mobile device; or

redemption of the DMC.

26. An apparatus for remote communication, comprising:

a coupon module that associates a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic;

a valuation module that establishes an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device;

memory that stores at least the coupon module and the valuation module to facilitate DMC distribution by the apparatus; and

a processor that executes the modules to implement DMC distribution.

27. The apparatus of claim 26, further comprising a transmitter that employs a wireless interface, at least in part, to send to the target mobile device at least one of:

the DMC; or

an indication of the DMC that identifies a sponsor or transaction associated with the DMC and further identifies at least one of:

the initial parameter for the variable coupon characteristic; or

a state of the variable coupon characteristic.

28. The apparatus of claim 26, wherein the valuation module evaluates the determinable circumstance and establishes the initial parameter before or when the DMC is associated with the target mobile device.

29. The apparatus of claim 26, wherein the valuation module further comprises a transaction database that stores a user profile history, which includes DMC usage information, mobile shopping information or DMC redistribution information, vendor profile information, DMC profile information or retailer profile information.

30. The apparatus of claim 29, further comprising a learning engine that evaluates the determinable circumstance based on information stored in the transaction database.

31. The apparatus of claim 26, wherein the valuation module at least one of:

secures the established initial parameter to mitigate change to the parameter by input from the target mobile device; or

enables re-evaluation of the initial parameter based at least in part on an input from the target mobile device.

32. The apparatus of claim 26, wherein the valuation module establishes the initial parameter after the coupon module associates the DMC with the target mobile device.

33. The apparatus of claim 26, wherein the valuation module re-establishes the initial parameter after the coupon module associates the DMC with the target mobile device based in part on at least one of:

a change in the determinable circumstance; or

an input at the target mobile device.

34. The apparatus of claim 29, further comprising:

a transceiver that participates in wireless data exchange with a mobile device;

a data mining module that obtains data pertaining to the mobile device; and

a filter module that compares the obtained data to one or more criteria for identifying the target mobile device and establishes the mobile device as the target mobile device based on a result of the comparison.

35. The apparatus of claim 34, wherein at least one of:

the filter module employs time, location information, a device capability, user interface function, or identity information associated with the mobile device as the one or more criteria; or

the data mining module extracts the obtained information from the mobile device, the valuation module, or a back-end server that contains at least user profile information, vendor profile information, DMC profile information or retailer profile information.

36. The apparatus of claim 26, further comprising a redemption module that applies or authorizes application of the DMC to a transaction.

37. The apparatus of claim 26, wherein the variable coupon characteristic comprises a redemption value applicable to a transaction.

38. The apparatus of claim 36, wherein the redemption module receives notice that the DMC is presented for redemption at a point of sale location and updates the valuation module with at least a redemption status of the DMC.

39. The apparatus of claim 36, wherein the redemption module modifies or authorizes modification of a default characteristic of the transaction based on the variable coupon characteristic.

40. The apparatus of claim 36, the redemption module provides DMC and transaction information to a clearinghouse server to facilitate reimbursement of a sponsor of the transaction based at least in part on the modified default characteristic.

41. The apparatus of claim 26, the valuation module employs a redemption value of the DMC as the variable coupon characteristic and evaluates the determinable circumstance to establish the redemption value based on at least one of:

association of the DMC with the target mobile device;
an input at the target mobile device;
a threshold change in the determinable circumstance; or
redemption of the DMC.

42. The apparatus of claim 26, further comprising a media integration module that integrates media into the DMC or bundles the media with the DMC, packages the DMC and media into a mobile device application, and transmits the application to the target mobile device.

43. The apparatus of claim 42, wherein the mobile device application utilizes an audio, visual, olfactory, or tactile function of the target mobile device.

44. The apparatus of claim 43, wherein the audio, visual, olfactory, or tactile function of the target mobile device is utilized to convey or augment a characteristic of a product or service.

45. The apparatus of claim 42, wherein the media includes an advertisement of a product, service, supplier or retailer pertinent to the DMC.

46. The apparatus of claim 42, wherein the media includes an advertisement of a third party other than a sponsor, recipient, or distributor of the DMC.

47. The apparatus of claim 46, wherein the coupon module modifies, initiates or completes a transaction with the third party if the advertisement is played at the target mobile device or other recipient mobile device.

48. The apparatus of claim 27, wherein the transmitter further sends to the target mobile device an executable module configured to evaluate the determinable circumstance and establish or modify the initial parameter.

49. The apparatus of claim 48, wherein the executable module is further configured to transmit the established or modified initial parameter to a DMC management server.

50. The apparatus of claim 48, wherein the executable module is further configured to evaluate the determinable circumstance based at least on at least one of:

association of the DMC with the target mobile device;

an input at the target mobile device;

a threshold change in the determinable circumstance; or

redemption of the DMC.

51. A DMC distribution device, comprising:

a first module configured to associate a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic;

a second module configured to distribute the DMC or an indication of the DMC to the target mobile device *via* remote data exchange; and

a third module configured to establish an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device.

52. An apparatus for wireless communication, comprising:

means for associating a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic; and

means for establishing an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device.

53. A computer program product for wireless communication, comprising:

a computer-readable medium comprising:

at least one instruction for causing a computer to associate a DMC with a target mobile device, wherein the DMC has at least one variable coupon characteristic; and

at least one instruction for causing a computer to establish an initial parameter for the variable coupon characteristic based on a determinable circumstance pertinent to the target mobile device.

54. A method of wireless communication, comprising:

obtaining a DMC or an indication of the DMC from a device, wherein the DMC has at least one variable coupon characteristic;

obtaining at least one factor relevant to establishing an initial parameter for the variable coupon characteristic; and

collecting data pertinent to the at least one factor to facilitate establishing the initial parameter.

55. The method of claim 54, further comprising at least one of:

calculating a quantitative or qualitative value for the initial parameter based at least in part on the collected data; or

providing the collected data to the device and receiving the value.

56. The method of claim 54, further comprising employing time, location of a recipient mobile device, feature of the mobile device, a mobile device user input, user, DMC, manufacturer, vendor or retailer profile information, or location of a vendor or retailer as the at least one factor.

57. The method of claim 54, further comprising obtaining electronic media pertinent to a product, service, sponsor, distributor, redemption rule, coupon characteristic adjustment rule or redistribution rule pertinent to the DMC.

58. The method of claim 57, further comprising playing the media and facilitating adjustment of the variable coupon characteristic based at least in part on the playing.

59. The method of claim 55, further comprising adjusting the value based at least in part on the collected data or on data collected subsequent receipt of the DMC.

60. The method of claim 55, further comprising freezing the value based at least in part on the collected data or a user input.

61. The method of claim 54, further comprising presenting information pertinent to the DMC at a recipient device, wherein the information comprises a product description, supplier information, manufacturer information, retailer information, vendor information, redemption instructions, expiration information, DMC identification (ID), a rule describing variation of the coupon characteristic or value added incentives.

62. The method of claim 61, wherein the information is presented as a multi-dimensional display that conveys feature richness of the DMC and augments at least one aspect of a product, service, sponsor, or retailer associated with the DMC.

63. The method of claim 54, further comprising presenting the DMC for redemption in conjunction with a transaction.

64. The method of claim 55, further comprising obtaining an algorithm for calculating the quantitative or qualitative value and obtaining a dynamic update to the algorithm that changes a manner in which the value is calculated.

65. An apparatus for wireless communication, comprising:

a transceiver configured for wireless communication, the transceiver that obtains from a wireless transmitter a DMC having at least one variable coupon characteristic, or an indication of such DMC, and at least one factor relevant to establishing an initial parameter for the variable coupon characteristic;

memory that stores the DMC or the at least one factor; and

a valuation engine that collects data pertinent to the at least one factor to facilitate establishing the initial parameter for the variable coupon characteristic.

66. The apparatus of claim 65, wherein at least one of:

the valuation engine calculates a quantitative or qualitative value for the initial parameter based at least in part on the collected data; or

the valuation engine provides, by way of the transceiver, the collected data to the device and receives the value.

67. The apparatus of claim 65, wherein the valuation engine employs time, location of a recipient mobile device, a feature of the recipient mobile device, a mobile device user input, user, DMC, manufacturer, vendor or retailer profile information, or location of a vendor or retailer as the at least one factor.

68. The apparatus of claim 65, wherein the DMC includes electronic media pertinent to a product, service, sponsor, distributor, redemption rule, coupon characteristic adjustment rule, or redistribution rule pertinent to the DMC.

69. The apparatus of claim 68, further comprising a user interface that plays the media, wherein the valuation engine adjusts the variable coupon characteristic based at least in part on playing the media.

70. The apparatus of claim 66, wherein the valuation engine adjusts the value based at least in part on the collected data or on data collected subsequent obtaining the DMC.

71. The apparatus of claim 66, wherein the valuation engine freezes the value based at least in part on the collected data or a user input.

72. The apparatus of claim 65, further comprising a playback module that presents information pertinent to the DMC at the apparatus, wherein the information comprises a product description, supplier information, manufacturer information, retailer information, vendor information, redemption instructions, expiration information, DMC identification (ID), a rule describing variation of the coupon characteristic or value added incentives.

73. The apparatus of claim 72, wherein the playback module presents the information as a multi-dimensional display that conveys feature richness of the DMC and augments at least one aspect of a product, service, sponsor, or retailer associated with the DMC.

74. The apparatus of claim 65, further comprising a redemption module that presents the DMC for redemption in conjunction with a transaction.

75. The apparatus of claim 66, further comprising an update module that obtains a dynamic update to an algorithm that calculates the quantitative or qualitative value, wherein the update to the algorithm changes a manner in which the value is calculated.

76. A mobile device, comprising:

a transceiver configured for wireless data exchange with a remote device;

a first module configured to obtain a DMC or an indication of the DMC from the remote device, wherein the DMC has at least one variable coupon characteristic;

a second module configured to obtain at least one factor relevant to establishing an initial parameter for the variable coupon characteristic; and

a third module configured to collect data pertinent to the at least one factor to facilitate establishing the initial parameter.

77. An apparatus for wireless communication, comprising:

means for obtaining a DMC or an indication of the DMC from a device, wherein the DMC has at least one variable coupon characteristic;

means for obtaining at least one factor relevant to establishing an initial parameter for the variable coupon characteristic; and

means for collecting data pertinent to the at least one factor to facilitate establishing the initial parameter.

78. A computer program product for wireless communication, comprising:

a computer-readable medium comprising:

at least one instruction for causing a computer to obtain a DMC or an indication of the DMC from a device, wherein the DMC has at least one variable coupon characteristic;

at least one instruction for causing a computer to obtain at least one factor relevant to establishing an initial parameter for the variable coupon characteristic; and

collect data pertinent to the at least one factor to facilitate establishing the initial parameter.

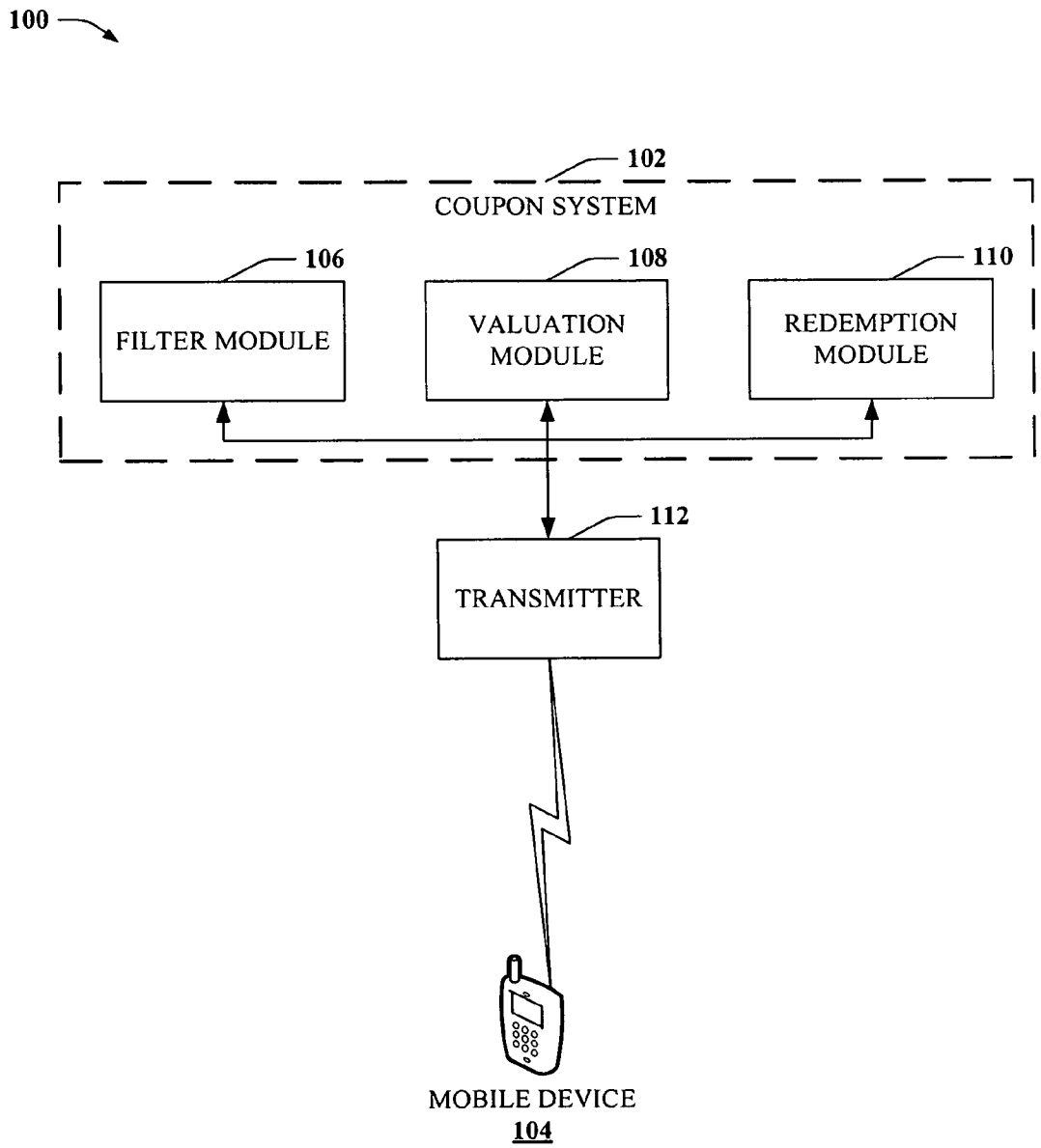
100
102
COUPON SYSTEM
106
FILTER MODULE
108
VALUATION MODULE
110
REDEMPTION MODULE
112
TRANSMITTER
MOBILE DEVICE
104

FIG. 1

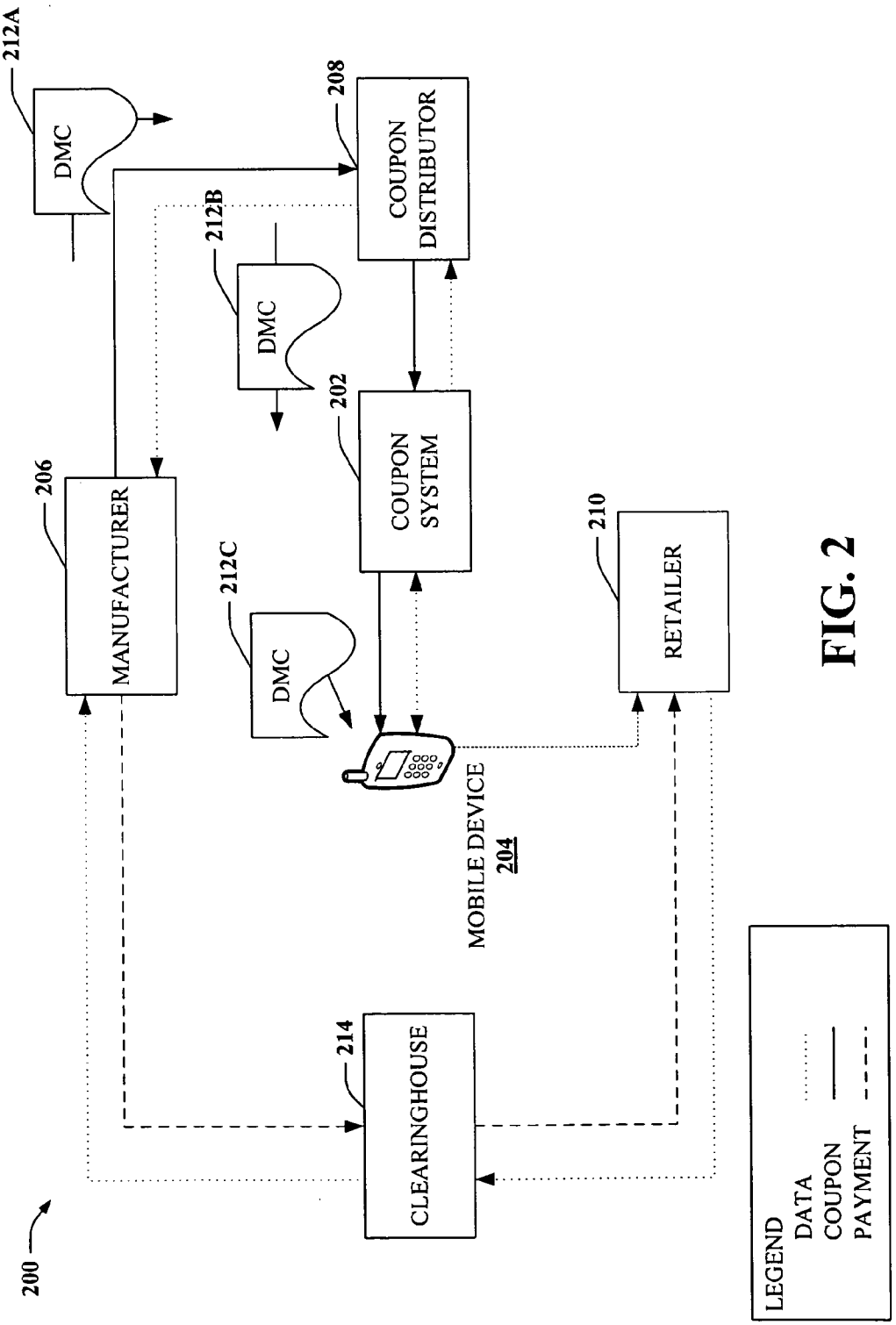
212A
DMC
208
COUPON DISTRIBUTOR
212B
DMC
202
COUPON SYSTEM
206
MANUFACTURER
212C
DMC
210
RETAILER
MOBILE DEVICE
204
214
CLEARINGHOUSE
200
LEGEND
DATA
COUPON
PAYMENT

FIG. 2

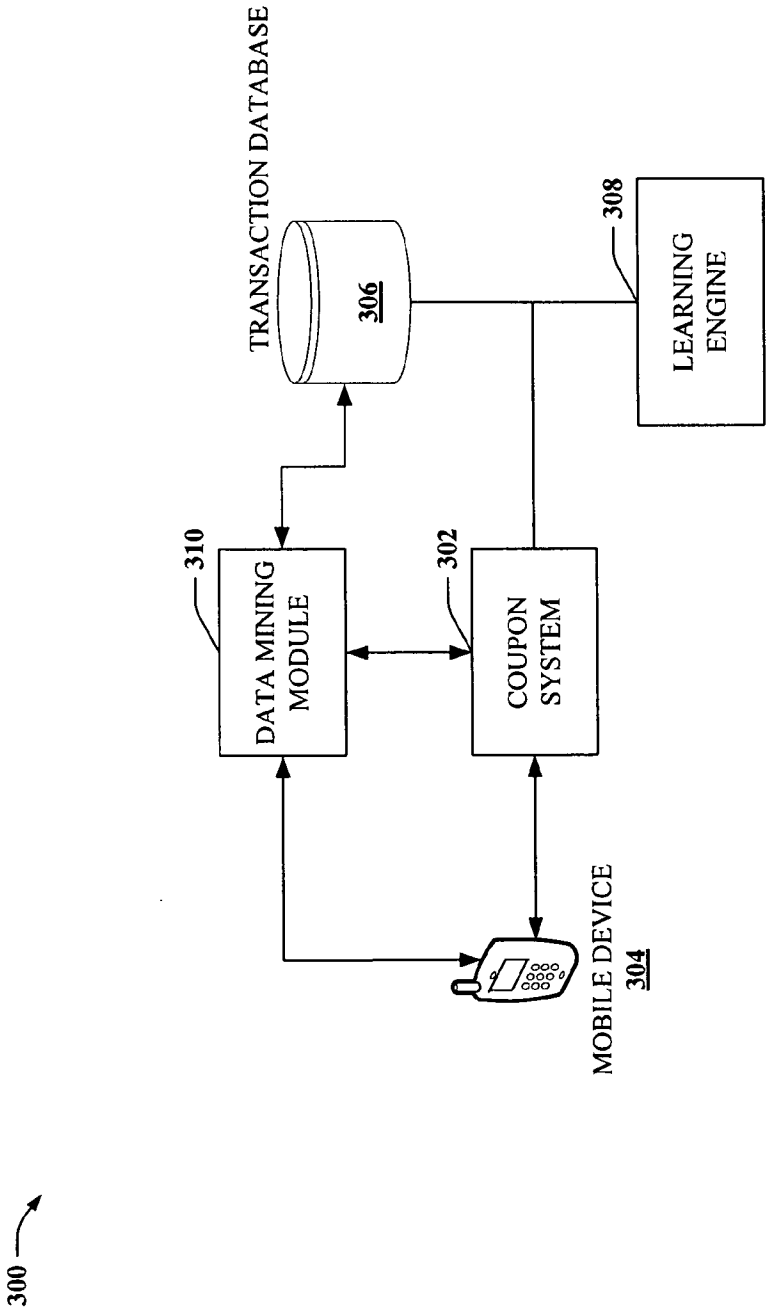
300
TRANSACTION DATABASE
306
308
LEARNING ENGINE
310
DATA MINING MODULE
302
COUPON SYSTEM
MOBILE DEVICE
304

FIG. 3

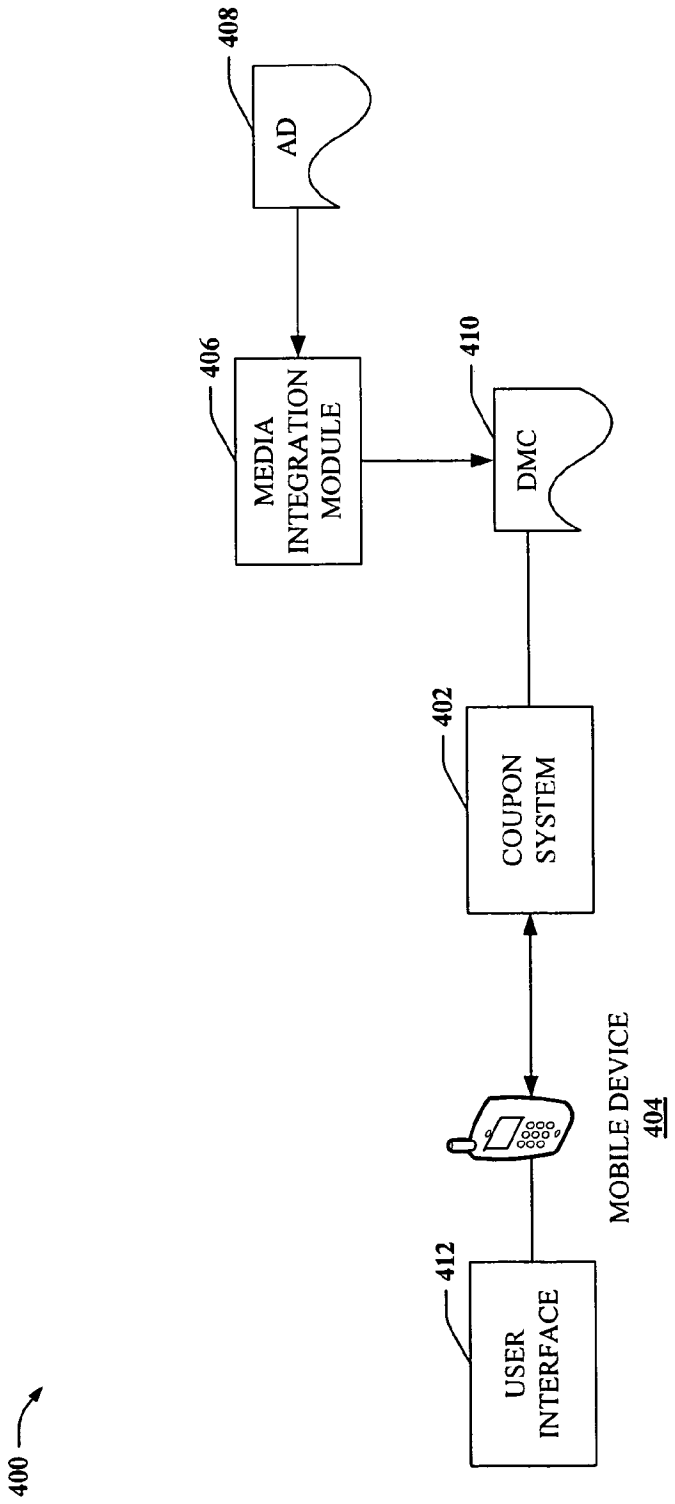
400
408
AD
406
MEDIA INTEGRATION MODULE
410
DMC
402
COUPON SYSTEM
MOBILE DEVICE
404
412
USER INTERFACE

FIG. 4

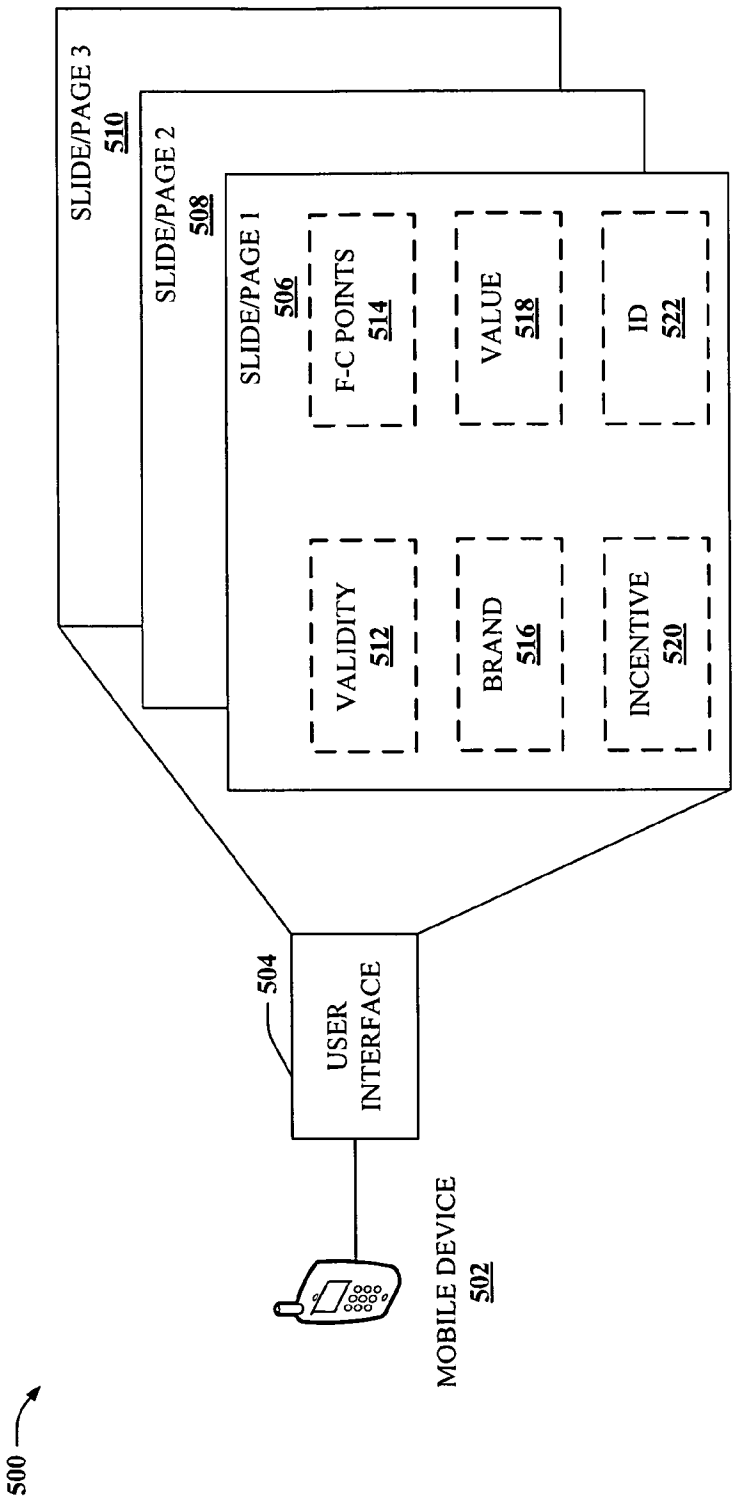
500
MOBILE DEVICE
502
504
USER INTERFACE
SLIDE/PAGE 3
510
SLIDE/PAGE 2
508
SLIDE/PAGE 1
506
F-C POINTS
514
VALUE
518
ID
522
VALIDITY
512
BRAND
516
INCENTIVE
520

FIG. 5

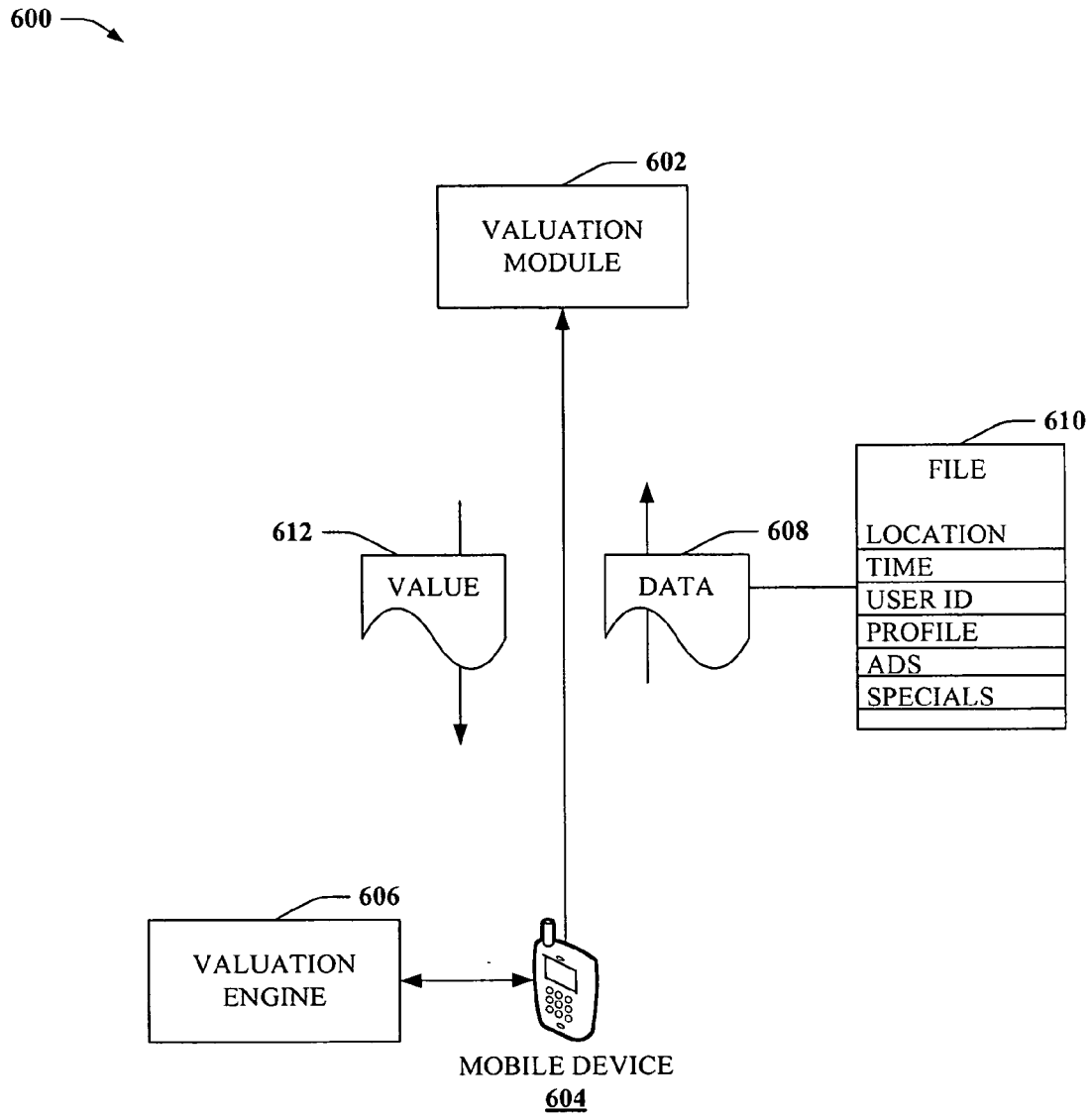
600
602
VALUATION MODULE
610
FILE
LOCATION
TIME
USER ID
PROFILE
ADS
SPECIALS
612
VALUE
608
DATA
606
VALUATION ENGINE
MOBILE DEVICE
604

FIG. 6

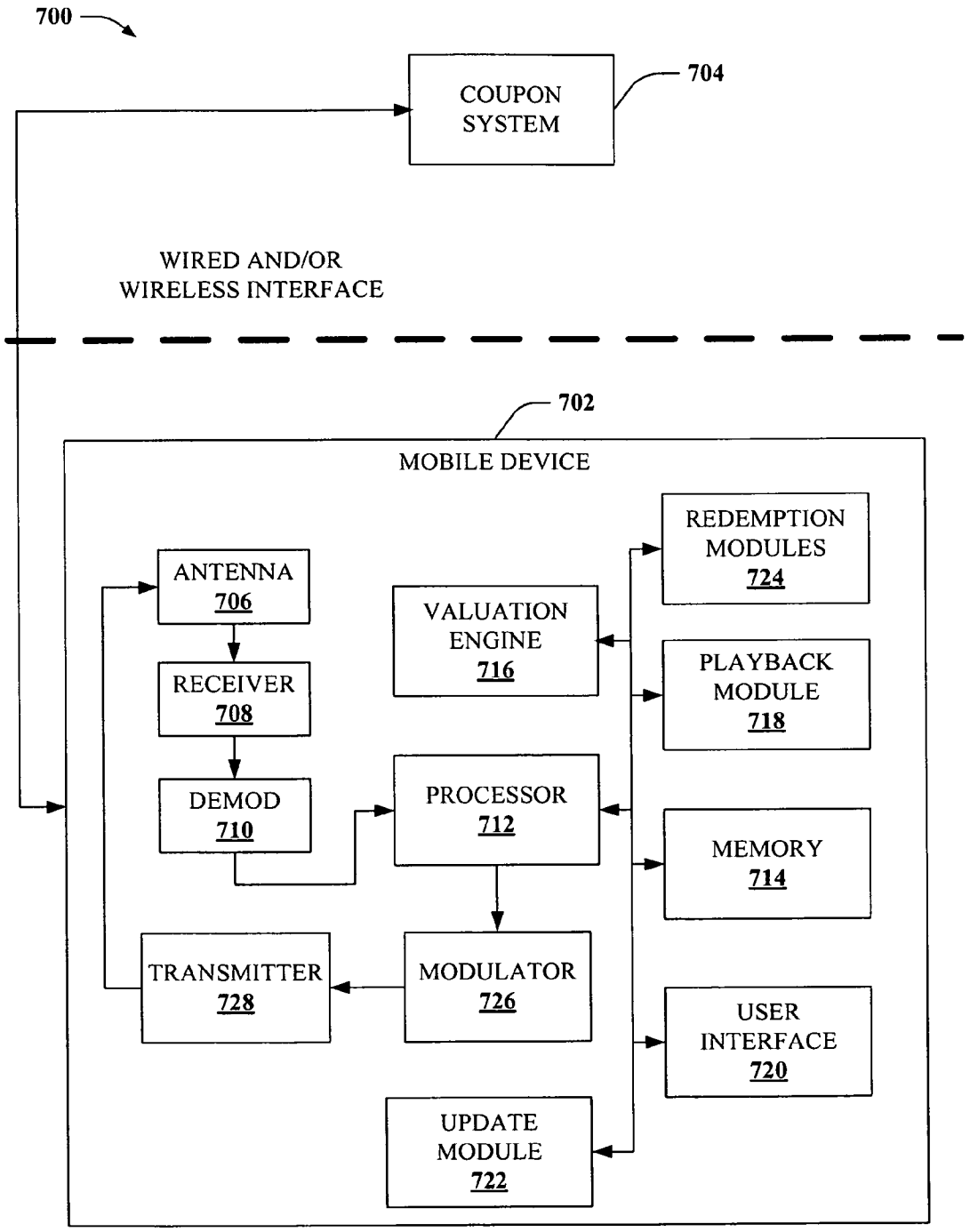
700
COUPON SYSTEM
704
WIRED AND/OR WIRELESS INTERFACE
702
MOBILE DEVICE
ANTENNA 706
RECEIVER 708
DEMOD 710
PROCESSOR 712
VALUATION ENGINE 716
REDEMPTION MODULES 724
PLAYBACK MODULE 718
MEMORY 714
TRANSMITTER 728
MODULATOR 726
USER INTERFACE 720
UPDATE MODULE 722

FIG. 7

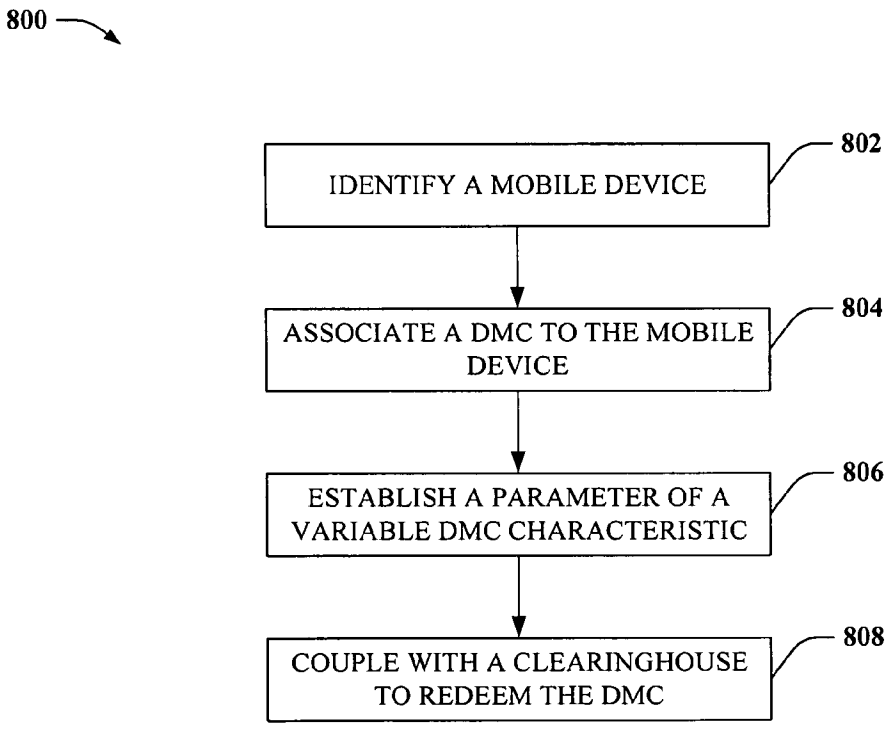
800
IDENTIFY A MOBILE DEVICE
802
ASSOCIATE A DMC TO THE MOBILE DEVICE
804
ESTABLISH A PARAMETER OF A VARIABLE DMC CHARACTERISTIC
806
COUPLE WITH A CLEARINGHOUSE TO REDEEM THE DMC
808

FIG. 8

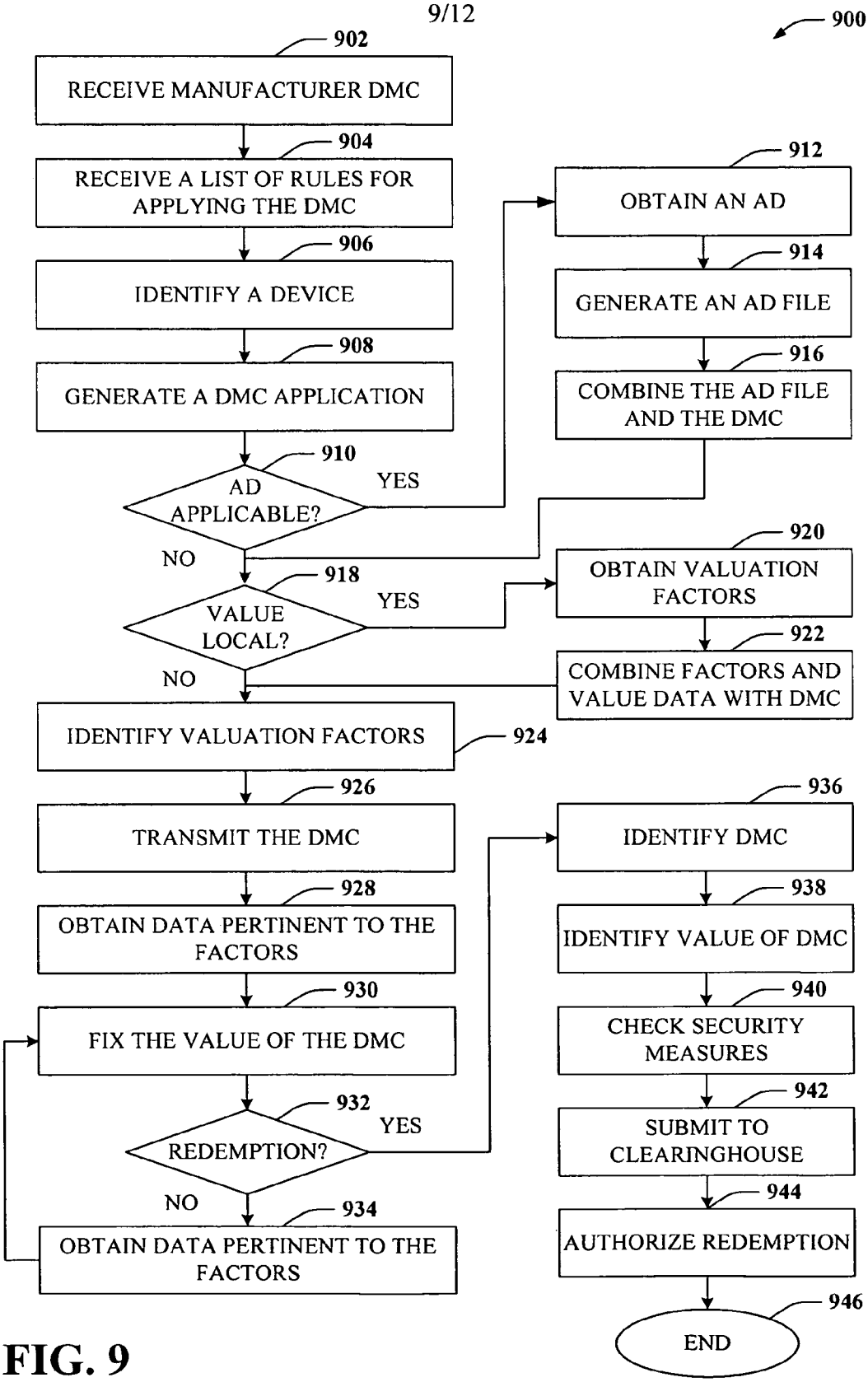
900
902
RECEIVE MANUFACTURER DMC
904
RECEIVE A LIST OF RULES FOR APPLYING THE DMC
906
IDENTIFY A DEVICE
908
GENERATE A DMC APPLICATION
910
AD APPLICABLE?
YES
NO
912
OBTAIN AN AD
914
GENERATE AN AD FILE
916
COMBINE THE AD FILE AND THE DMC
918
VALUE LOCAL?
YES
NO
920
OBTAIN VALUATION FACTORS
922
COMBINE FACTORS AND VALUE DATA WITH DMC
924
IDENTIFY VALUATION FACTORS
926
TRANSMIT THE DMC
928
OBTAIN DATA PERTINENT TO THE FACTORS
930
FIX THE VALUE OF THE DMC
932
REDEMPTION?
YES
NO
934
OBTAIN DATA PERTINENT TO THE FACTORS
936
IDENTIFY DMC
938
IDENTIFY VALUE OF DMC
940
CHECK SECURITY MEASURES
942
SUBMIT TO CLEARINGHOUSE
944
AUTHORIZE REDEMPTION
946
END

FIG. 9

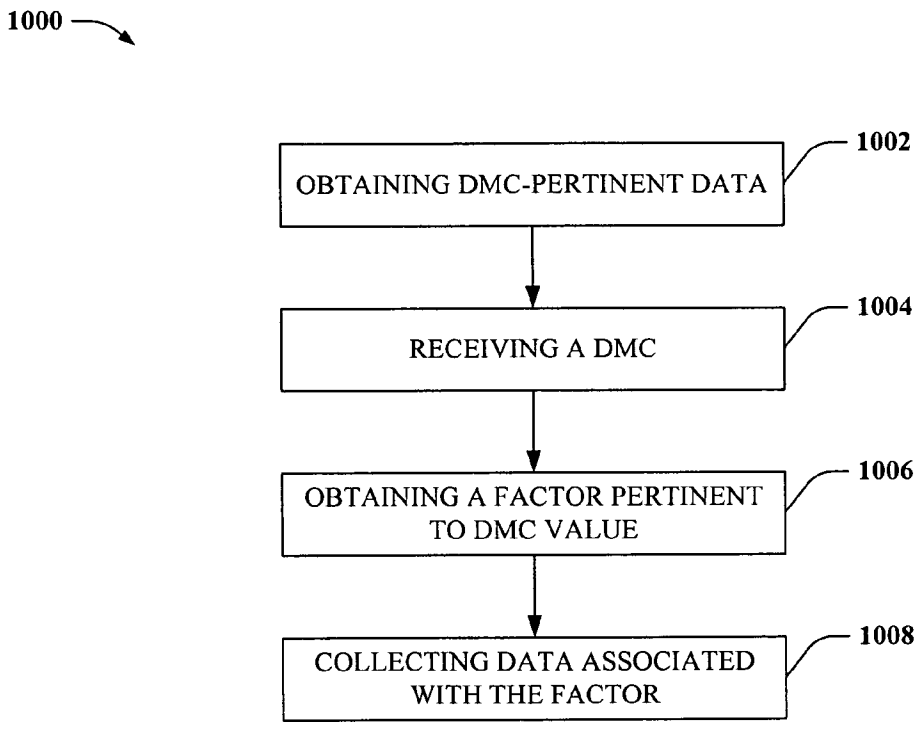
1000
OBTAINING DMC-PERTINENT DATA
1002
RECEIVING A DMC
1004
OBTAINING A FACTOR PERTINENT TO DMC VALUE
1006
COLLECTING DATA ASSOCIATED WITH THE FACTOR
1008

FIG. 10

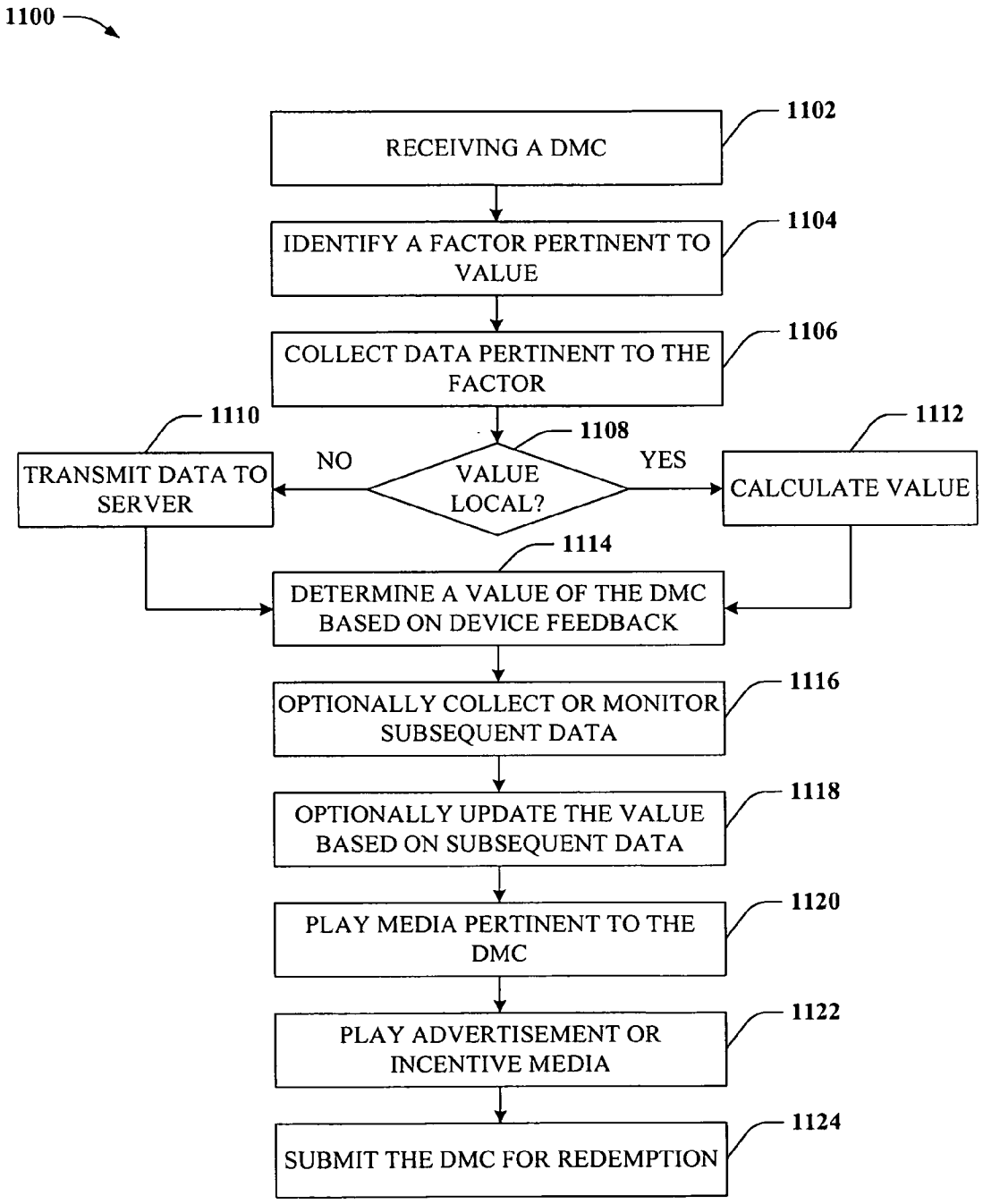
1100
RECEIVING A DMC
1102
IDENTIFY A FACTOR PERTINENT TO VALUE
1104
COLLECT DATA PERTINENT TO THE FACTOR
1106
1108
VALUE LOCAL?
NO
YES
1110
TRANSMIT DATA TO SERVER
1112
CALCULATE VALUE
1114
DETERMINE A VALUE OF THE DMC BASED ON DEVICE FEEDBACK
OPTIONALLY COLLECT OR MONITOR SUBSEQUENT DATA
1116
OPTIONALLY UPDATE THE VALUE BASED ON SUBSEQUENT DATA
1118
PLAY MEDIA PERTINENT TO THE DMC
1120
PLAY ADVERTISEMENT OR INCENTIVE MEDIA
1122
SUBMIT THE DMC FOR REDEMPTION
1124

FIG. 11

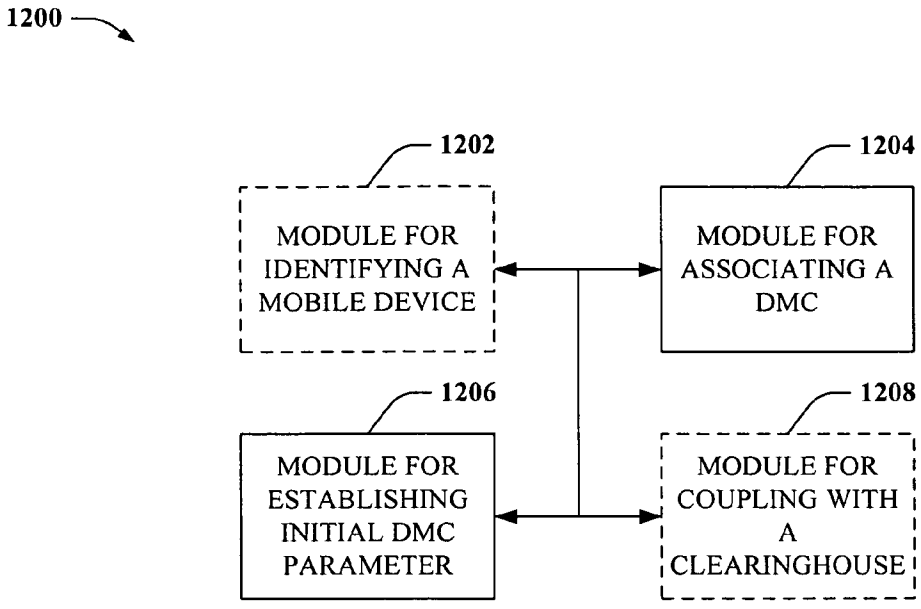
1200
1202
MODULE FOR IDENTIFYING A MOBILE DEVICE
1204
MODULE FOR ASSOCIATING A DMC
1206
MODULE FOR ESTABLISHING INITIAL DMC PARAMETER
1208
MODULE FOR COUPLING WITH A CLEARINGHOUSE

FIG. 12

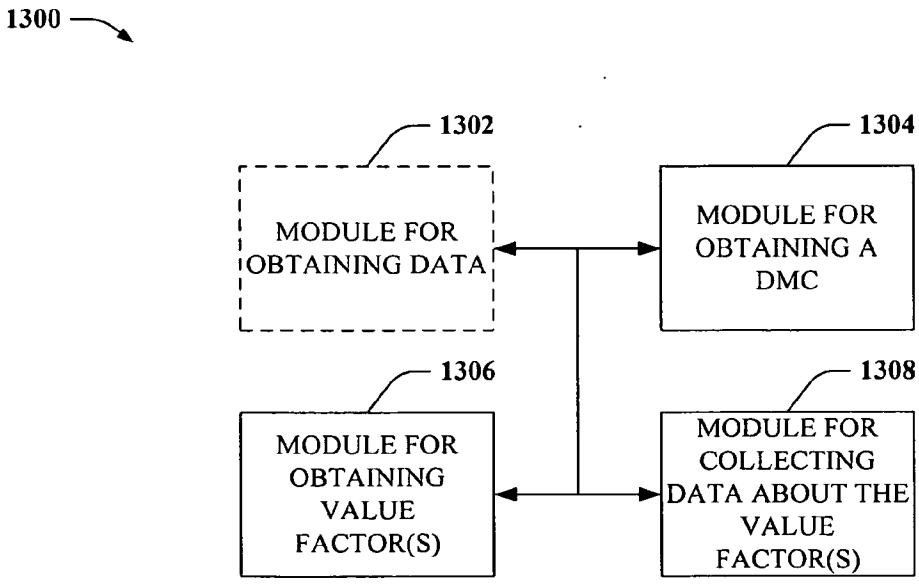
1300
1302
MODULE FOR OBTAINING DATA
1304
MODULE FOR OBTAINING A DMC
1306
MODULE FOR OBTAINING VALUE FACTOR(S)
1308
MODULE FOR COLLECTING DATA ABOUT THE VALUE FACTOR(S)

FIG. 13

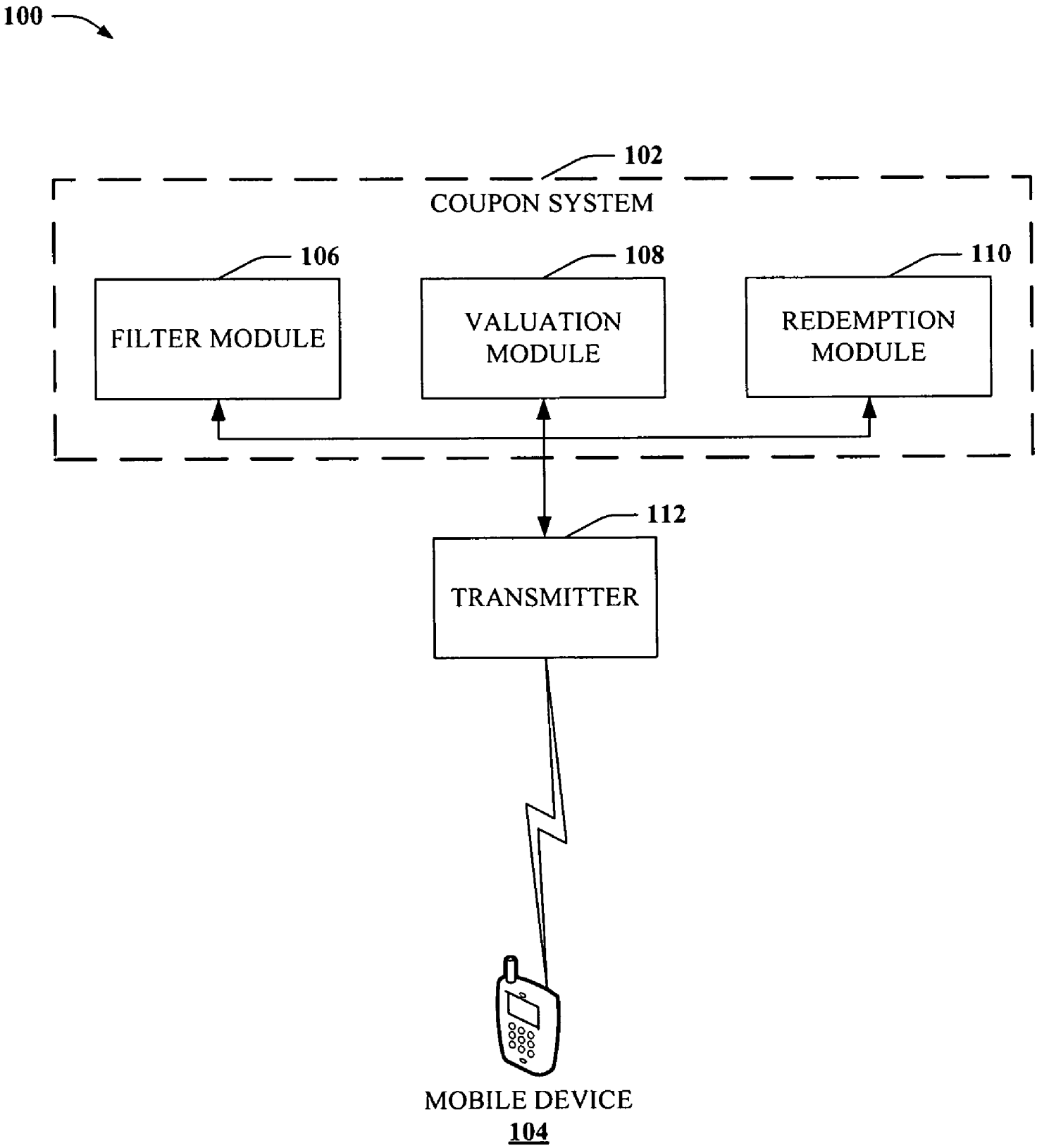
100
102
COUPON SYSTEM
106
FILTER MODULE
108
VALUATION MODULE
110
REDEMPTION MODULE
112
TRANSMITTER
MOBILE DEVICE
104

FIG. 1

Publication Number: EP 0156856 A1
Publication Date: Oct 09, 1985

## Abstract of equivalent WO 85/01373 A1

A system for monitoring and controlling the distribution of product coupons from a plurality of remote terminals located at the point of sale. The system includes video display terminals for displaying an array of coupons available for selection and means for monitoring and controlling the number of coupons distributed.

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International application published by the World Intellectual Property Organisation under number:

WO 85/01373 (art.158 of the EPC).

Demande internationale publiée par l'Organisation Mondiale de la Propriété Intellectuelle sous le numéro:

WO 85/01373 (art.158 de la CBE).

Publication Number: WO 85/01373 A1
Publication Date: Mar 28, 1985

## Abstract

A system for monitoring and controlling the distribution of product coupons from a plurality of remote terminals located at the point of sale. The system includes video display terminals for displaying an array of coupons available for selection and means for monitoring and controlling the number of coupons distributed.

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(33) Priority Country: US

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(74) Agent: HEWITT, Lester, L.; Pravel, Gambrell, Hewitt & Kimball, Tenth Floor, 1177 West Loop South, Houston, TX 77027 (US).

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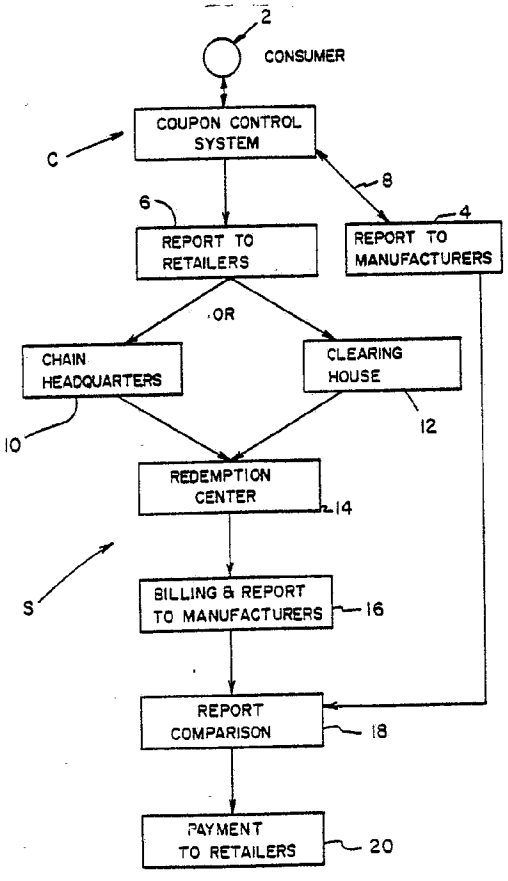
(57) Abstract

A system for monitoring and controlling the distribution of product coupons from a plurality of remote terminals located at the point of sale. The system includes video display terminals for displaying an array of coupons available for selection and means for monitoring and controlling the number of coupons distributed.



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I

# METHOD AND APPARATUS FOR CONTROLLING THE DISTRIBUTION OF COUPONS

## Specification

## BACKGROUND OF THE INVENTION

1. Field of Invention:

The present invention relates to a method and apparatus for distributing coupons or other redemption certificates for retail sales of merchandise, such as groceries and dry goods and to a method and apparatus for monitoring and controlling the number of such coupons issued and/or redeemed.

2. Description of the Prior Art

In the past, it was a common marketing scheme for manufacturers to distribute large numbers of coupons or similar redemption certificates in local newspapers or other productions distributed to the general public. These coupons typically included an advertisement for the particular product and provided a discount off the regular price if presented at a participating grocery store at the time of purchase. Coupons redeemed at the various retail outlets were sent to a national clearing house which calculated the amount due to the retailers and billed the manufacturers for the portion due on account of sales of their respective products. While the distribution of coupons was generally regarded as a good advertising and

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marketing technique, the prior art methods of coupon distribution and redemption had serious drawbacks for the manufacturers. For example, the only way redemption has been at all measured is by prior studies, which shows an average redemption to be about 3%. Actual redemption could not be controlled. It was possible that a particular manufacturer's coupon could have an unexpectedly high redemption and cost much more than anticipated.

Furthermore, the prior art method of distribution lent itself to fraudulent practices both by the individual redeeming coupons at a retail store and by the retail outlet itself. For example, an individual purchasing a large amount of groceries during peak business hours at a particular store could have easily been credited for coupons or products they had not actually purchased because of the inconvenience to the store employee of checking each item versus the coupons. The retail stores would, in such circumstances, routinely present all coupons, including those erroneously redeemed, to the national clearing house for payment. It was also possible for store employees to obtain cash for coupons without purchasing the products. In all of these circumstances, the manufacturer was held responsible for the value of the coupon without having made a sale of the product.

## SUMMARY OF THE INVENTION

In contrast to the prior art methods and apparatus, the method and apparatus of the present invention provides a unique, controlled coupon advertisement and distribution system which enables the manufacturer to control its liability for coupons and to deter fraudulent redemption. In the method and apparatus of the present invention, the manufacturer may prescribe a particular number of coupons to be redeemed collectively and at each particular retail store. The present invention also greatly reduces the possibility of fraud by enabling coupons to be encoded



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with store identification numbers, expiration dates, uniform product codes, and other information at the point of distribution. By providing point of sale distribution and same day expiration dates the system of the present invention also provides substantial inprovement in the manufacturer's coupon redemption rate as compared to the three per cent rate experienced in the past.

A stand alone coupon dispensing terminal is provided at each retail store. Each stand alone terminal communicates with a host central processing unit located remote from the stores. Coupons are displayed for customer selection at each dispensing terminal on a video menu via a cathode ray tube and touch screen combination in a fashion which enhances customer acceptance by reducing the time necessary to select and obtain coupons. Each terminal may be monitored and controlled via the host computer to obtain data such as the number of coupons issued and the identification of customers using the terminal. The system enables the manufacturer to limit the number of a particular coupon issued from a terminal as well as the number issued in response to activation by a particular credit card. Each terminal includes a self-contained high speed coupon printer which prints the product information, date, time of day, uniform product code, expiration date, a store identification number or any other information desired for particular applications on each coupon issued. The features of the method and apparatus of this invention are too many to mention in this summary. The specification to follow and the claims will particularly point out this invention.

In summary, the present invention provides great benefits to the product manufacturers by enabling the manufacturer to control its maximum liability and reducing the potential for fraud, and benefits the consuming public by providing a convenient means for obtaining coupons at the point of purchase only for those items they desire to

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buy at the time, thereby eliminating the need to clip and save coupons from the newspapers or other advertisements.

## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram of a system and its role in the over-all coupon reporting and redemption process.

Fig. 2 is a schematic diagram of the system for controlling the distribution and redemption of coupons according to the present invention of Fig. 1.

Fig. 3a is a perspective view of a coupon dispensing terminal which forms part of the system of Fig. 2.

Fig. 3b is a typical coupon printed by the system of this invention.

Fig. 4 is a schematic block diagram of a portion of the coupon dispensing terminal of Fig. 2 and its interface with the host central processing unit.

Figs. 5-9 are schematic flow chart diagrams for the general operation of the remote dispensing terminal computers of Fig. 2 to achieve the desired results of the present invention.

Figs. 10-28 are schematic flow chart diagrams for achieving the particular tasks in the general operations illustrated in Figs. 5-9.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

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I. System Overview
II. Description of the Distribution System
III. Terminal Components
IV. Description of the Operation of the Dispensing Terminals
V. Conclusion
A. Operational Modes: General Logic
B. Detailed Description of Command Sub-Sequences
1. The Executive Sequence
2. The Foreground Sub-Sequences
a. Card Reader Interrupt

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b. Interrupt From the Output to the Cathode Ray Tube
c. Interrupt from Clock
d. Touch Screen Interrupt
e. Printer Output Interrupt (FPOINT)
f. Printer Input Interrupt (FPIINT)
g. Modem Output Interrupt (FCOINT)
h. Modem Input Interrupt (FCIINT)

3. The Background Task Sub-Sequence
a. Background Idle Loop Sequence (BIDLE)
b. Customer Account Number Search Task (BPSTSK)
c. Touch Screen Task (BTSTSK)
d. Timer Task (BTMTSK)
e. Printer Output Task (BPOTSK)
f. Alarm Task (BALTSK)
g. Data Transmission to Host H
h. Terminal Control Via Host H

I. System Overview

Referring now to Fig. 1, the coupon distribution system of the present invention is illustrated in schematic form in its role in the over-all coupon reporting and redemption process, and designated generally by the letter S. The system S includes a coupon control system C of the present invention which interacts with the consumer 2 to selectively dispense coupons as requested. System C also generates reports 4 and 6 regarding coupon distribution for the manufacturers and retailers, respectively.

In the system of the present invention, the manufacturer is able to prescribe limits for distribution of particular coupons on a collective and per store basis. This feature is illustrated schematically in Fig. 1 by the bi-directional arrow 8. The report 4 is provided to the manufacturer on a periodic basis, such as a weekly basis and includes coupon distribution information for each retail outlet. Report 4 may include the number of coupons dispensed, the store identification information, the dates

and times of distribution, and customer identification data. This information is valuable to the manufacturer both as an aid in analyzing its marketing techniques and in detecting possible fraudulent coupon distribution or redemption. The report 6 provided to retailers is essentially like report 4 but includes information only as to the particular retail store(s) involved.

Typically, retailers forward the report 6 to a retail chain headquarters 10 or a clearing house 12 to provide a collective accounting for the retail chain or region. In either event, the coupon distribution information is presented to a redemption center 14 which receives such information from retailers throughout the country and prepares a billing statement and report 16 for each participating manufacturer.

The reports 16 and 4 are compared at step 18 to detect errors or fraudulent claims. For example, if the number of coupons presented for redemption exceed the number of coupons dispensed as noted in report 4, the manufacturer may refuse to make payment to the retailers for the excess. Once the system of the present invention is utilized, such discrepancy will be minimized since the manufacturer will be able to pin point and investigate error sources. The manufacturer will make payment to the particular retailers at step 20 thereby concluding the periodic , quarterly, monthly or weekly transaction.

In this fashion, the manufacturer is able to precisely control the number of coupons dispensed on a collective and per store basis and to monitor coupon redemption to prevent fraud. The details of the system S are included in the remaining figures of the drawings and the accompanying description.

II. Description of the Distribution System

Referring now to Fig. 2, the coupon control system C is generally illustrated in schematic block diagram form. System C includes a host central processing unit H which communicates with a number of coupon dispensing terminals



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T, designated T-1 through T-N, via a conventional telecommunications modem M. Each terminal T includes a corresponding customer interface I, designated I-1 through I-N.

Host computer H may be any programmable central processing unit having suitable data storage and processing capabilities to perform the functions described in detail hereinafter. Selection of a particular central processing unit depends upon the needs of the particular distribution system and, given the description contained herein, is a matter within the ordinary skill in the art. In one application, a Digital Equipment Corporation 11T23 System has been used to perform the function of the host computer H and has performed satisfactorily. Other suitably programmed computers having similar architecture could likewise be employed.

Host computer H monitors the operation of the individual terminals T and provides terminals T with the information necessary to dispense the coupons requested by customers. Host computer H stores the data which constitutes the array of coupons available for selection which will be displayed on each terminal T. Thus, the operator is able to control the display of coupons at each and every remote terminal T via host computer H. Host computer H also retains other information such as the date and time of day which is used by the terminals T to achieve the desired results of the present invention. This information is provided to the terminals T in the manner described hereinafter. Host computer H also is programmed to interact with terminals T to allow the operator to prescribe per store and collective limits for each coupon thereby controlling the manufacturers liability.

Most importantly, host computer H is programmed to receive from the terminals T coupon transaction information including the number and type of coupons dispensed, store identification numbers, and customer

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account numbers. Host computer H is programmed to use the information to generate the weekly reports 4 and 6 (Fig. 1) for the manufacturer and retailer, respectively. Programming of the host computer H, given the operational specifications for the host contained herein, and the detailed specification of programming for terminals T described herein, is a matter of ordinary skill in the art of computer programming and hence need not be described herein in detail.

Each of terminals T (Fig. 3) is a stand-alone unit to be placed at a remote location such as in a retail grocery store. Terminals T include a customer interface display I, a coupon dispensing apparatus D, and an activator A (Fig. 3). Terminals T also include a central processing unit such as a microcomputer 22 and the associated peripheral circuitry illustrated schematically in Fig. 4. A terminal housing 24 is provided to enclose the terminal hardware and also to provide storage space in lower cabinet 26 for conveniently storing extra paper for coupons or other materials.

Customer interface display I includes a conventional cathode ray tube 28 for displaying the video menu of coupons available for selection as well as other video graphics, such as advertisements, in response to signals received from microcomputer 22. Overlaying cathode ray tube 28 is a transparent, touch sensitive screen 30 which includes an array of touch activated switches arranged in a regular array to overlay particular coupons displayed on cathode ray tube 28. In the preferred embodiment, a screen having an array of thirty-two (32) switches such as the Model Number TK120S manufactured by Interaction Systems, Inc. is used. Other commonly available and suitable touch sensitive screens may also be employed. In the preferred embodiment, the coupons and switches are arranged so that two switches overlay each coupon to make selection by the customer less troublesome. Other switches incorporated in the touch screen array do not



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correspond to particular coupons but to functions which permit the customer to: (1) hold the page presently being displayed for an additional time period, ie., ten seconds; (2) cause the terminal T to display the next page of the video menu immediately, and (3) quit the selection process prior to reviewing the entire menu.

As will be described in detail below, microcomputer 22 will cause terminal T to sequentially display in page format an entire menu of coupons available for selection. If after a prescribed period of time no selection has been made, microcomputer 22 will cause terminal T to display the next page of coupons and so on until the entire menu has been completed. If no selection has been made throughout the the display process after a prescribed time period, microcomputer 22 causes terminal T to deactivate from the coupon dispensing mode, and begin displaying full page advertisements in a free-standing mode until such time as a customer reactivates terminal T via activator A.

Activator A is a conventional magnetic card reading apparatus adapted to read the data encoded on magnetic tape used in common consumer credit cards. Activator A provides a signal to activate terminal T to the coupon dispensing mode whenever a credit card having an encoded magnetic tape strip is inserted therein. Any of the common bank, gasoline or retail credit cards will activate the terminal T. While this does not prevent a single customer having more than one credit card from repeatedly using the terminal T, use of a credit card activator provides the informational capability as described below to somewhat limit the number of unauthorized transactions and further prevents children from activating the machine.

As will be described hereinafter, terminal T displays only those coupons currently available to the particular customer. Upon activation, terminal T determines whether the same credit card account number has been used within the last week or other predesignated period by comparing

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the present credit card number with those stored in memory in microcomputer 22. If so, microcomputer 22 permits only those coupons still available for selection by that particular customer account number to be displayed. If, for example, the manufacturer has prescribed a one per customer limit for a coupon, and that coupon has been previously issued to the customer under the same credit account number, the coupon will not be displayed. Furthermore, even if the particular credit account number has no selection history, if the maximum number of a particular coupon either collectively or on a store by store basis have been issued, that coupon will no longer be displayed. In this fashion, a manufacturer is provided with much more control over the maximum redemption liability than the prior art method of newspaper distribution.

Coupon dispenser D includes a high speed printer 32 (Fig. 4) of the type suitable for printing on heat sensitive paper to print the coupons selected by the customer. As will be described in detail below, once a particular coupon or group of coupons has been selected, microcomputer 22 causes the data which makes up the particular coupon(s) to be transmitted to coupon printer 32 whereupon the selected coupon(s) are automatically printed and dispensed. Furthermore, if dispenser D fails to provide a signal to indicate that the particular coupon(s) have been printed within a prescribed time period, microcomputer 22 causes an error message to be forwarded to host computer H which places terminal T in the free-standing advertising mode until the problem is rectified.

In the preferred embodiment, coupons are printed on a continuous length of heat-sensitive paper and cut at the appropriate point by a combined printer and cutting machine mounted within terminal T. The coupons printed by dispenser D generally contain the product information and the discount to be applied to the regular price. The



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system of the present invention allows additional information to be printed on the coupon to deter fraud and to encourage prompt use of the coupon. Since dispenser D prints the coupons from data provided from host computer H via terminal T, daily updated expiration dates may be included on the coupon to set, for example, a same day expiration date to encourage immediate use of the coupon. Furthermore, electronically readable uniform product codes may be included on the coupon in the same fashion as the expiration dates or other data specified herein so that an appropriately programmed check out register can read the product code on the coupon and apply the coupon discount only if a product bearing the identical product code has been purchased. This feature prevents customers from overwhelming the store's employees with a large number of coupons and groceries at peak business hours to obtain the benefit of the coupon discount without purchasing the corresponding product.

Coupons are conveniently dispensed to the customer via a slot 34 in the terminal housing 24 as they are printed and cut. It is a feature of the present invention that a customer may select any or all of the displayed coupons and go on to the next page of the menu without having to wait for the selected coupons to be printed. This is accomplished by providing programming and memory associated with microcomputer 22 which stores the customer's selections and prints them sequentially as soon as possible.

The video display presented on terminal T is either in a free-standing advertising mode wherein full screen advertisements for particular products are sequentially displayed or, in the coupon dispensing mode wherein a page formatted, video menu of coupons is displayed for selection by the customer. Terminal T automatically deactivates to the free-standing mode once the entire menu of coupons has been displayed and the appropriate time has elapsed. Interface I also includes a "quit" switch, not



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associated with a particular coupon which permits the customer to abort the normal terminal display sequence before all the coupons have been displayed. This feature frees the terminal T quickly for use by another customer without requiring the display sequence to be completed in each customer transaction, and thereby also prevents subsequent customers from selecting coupons on the previous customer's account number when the previous customer completes his selection before the entire array of coupons is presented. As will be described below, upon activation of the quit switch, microprocessor 22 causes terminal T to return to its free-standing mode prior to the completion of the normal display cycle.

It is a feature of the present invention that the terminal T automatically rotates the order in which the individual coupons are displayed on the cathode ray tube viewing screen 28 each time the terminal is activated. Thus, each particular manufacturer's coupon will appear on the first page of the menu in rotation with the remaining pages and no manufacturer is given preferential marketing treatment.

Each of the terminals T communicates with host computer H to receive updated coupon information and to transmit coupon transaction data. Microcomputer 22 in terminal T automatically establishes communication with host computer H and transfers coupon transaction data at the completion of every seventh transaction. Each transaction is defined by an activation of terminal T via activator A. The information thus provided to host computer H is utilized to compile coupon distribution reports 4 and 6 (Fig. 1) and to monitor the distribution of coupons on a continuous basis.

III. Terminal Components

Further details of terminal T are shown schematically in Fig. 4. As noted above, terminal T includes an activator A, a dispenser D, a customer interface display I



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and a microcomputer 22 with associated peripheral circuitry. Activator A having a conventional magnetic card reading apparatus 36 for reading information from one or more of the magnetic strip tracks on standardized consumer credit cards, and a conventional card reader interface 38 for converting the digitally encoded data from reader 36 into a telecommunication conventional serial format such as ASCII for transmission to microcomputer 22.

Activator A also includes a conventional universal asynchronous receiver/transmitter (UART) 40 which enables data to be transmitted and received between microcomputer 22 and card reader interface 38 in the conventional manner. In the preferred embodiment, UART 40 as and the other UARTS described hereinafter provide a vectored interrupt signal for microcomputer 22 via addressable data bus 42 thereby identifying the source of the interrupt. An interrupt from UART 40 signals the receipt of customer credit account information for transmission to microcomputer 22.

Data bus 42 may be any suitable, addressable data communications bus, such as the Digital Equipment Corporation Q-bus.

Dispenser D includes coupon printer 32 described above, and printer interface 44 which functions similarly to card reader interface 38 to transmit signals to and from printer 32 to microcomputer 22 in digital ASCII format via UART 46.

Customer interface display I includes touch screen 30 described above and associated interface 48 and UART 50 which provide digital, ASCII communications between touch screen 30 and microcomputer 22 in the conventional manner. For example, the analog signals generated by touch screen 30 in response to customer touch selection are converted to digital, ASCII format signals by interface 48 and transmitted to microcomputer 22 via UART 50. UART 50 transmits the data which comprises the coupons or

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advertising information from microcomputer 22 via bus 42 to conventional cathode ray tube interface 52 which converts the digitally formatted graphics data which comprises the coupons or advertising to a format suitable for use by display cathode ray tube 28.

Full duplex communication between microcomputer 22 and host computer H is conducted via modem M and UART 54 functioning in the conventional manner.

In the illustrated embodiment (Fig. 4) microcomputer 22 is an interrupt driven central processing unit such as the Digital Equipment P.D.P. 11/2 which performs data processing functions but has no internal random access memory. Other suitable large scale integrated circuit data processing units with or without internal random access memory could be utilized as well. Associated with microcomputer 22 via bus 42 are a conventional non-volatile read only memory 56, and random access memories 58 and 60. Non-volatile memory 56 may be any suitable non-volatile memory circuit such as the QSB-11 Bubbl-Tec Corporation bubble memory having a one-hundred twenty-eight kilobyte capacity. In the system of the present invention, memory 56 is utilized to store the operating system and background programs for microcomputer 22, the graphic display data, i.e., coupon and advertisements to be displayed on the terminal screen, and current customer credit account numbers and coupon transaction history. Much of this information is duplicated in memories 58, 60 but stored in non-volatile, bubble memory 56 to ensure against loss of the information in the event of power failure.

Memories 58, 60 are conventional thirty-two kilobyte random access memory circuits having serial R.S. 232 data ports and adaptable parity and baud rates so as to be compatible with microcomputer 22 and associated peripheral devices. Memories 58, 60 are utilized by microcomputer 22 for input/output addressing functions, storing operating programming, customer account numbers,



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coupon and advertising data and other functions as described hereinafter in the detailed description of the microcomputer operating program.

Power supply 62 is a conventional direct current power supply suitable for providing terminal T with D.C. power at the specified levels from alternating current line voltage at the remote terminal location. Power supply 62 may also include a keyed switch 64 to allow the terminal T to be energized or de-energized only by persons having a key, such as the store manager, for example.

IV. Description of the Operation of the Dispensing Terminals

A general description of the command sequences for microcomputer 22 will be provided with references to the schematic flow charts in Figs. 5-9. Fig. 5 illustrates the system hierarchy and relative program module priority and identifies the various sub-sequences which microcomputer 22 utilizes to achieve the functional steps set forth in Figs. 5-9. Where necessary or appropriate, these sub-sequences will be described in detail, those not described in detail are matters within the ordinary skill in the programming art. The command sequences for microcomputer 22 are implemented under a foreground/background concept, in which foreground (realtime, interrupt-driven) programs receive on demand immediate, short term control of microcomputer 22, and background (scheduled or requested) programs run over longer periods during non-interrupt time. All interrupt, foreground command sequences are executed on demand, while sequence EXEC, the principal background sequence, and the other background sequences which are utlized by EXEC are run on available, i.e., non-interrupt time. These command sequences will be referred to hereinfter by the designations appearing in Fig. 5.

A. Operational Modes: General Logic

In general, terminals T operate in four basic modes, which are:

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(1) Start up (Fig. 6), with an automatic transition to one of the following on-line modes when all start up parameters are satisfied;

(2) Normal customer (Fig. 7) , with the customer recognition, coupon request and coupon print operations proceeding normally;

(3) Hide and Watch (Fig. 8), with the terminal T available for operating and advertising functions, but commanded by host computer H not to issue coupons; and

(4) Modem Operations (Fig. 9), which are concurrent with the on-line modes, in which full duplex transfer with the host computer H are supported without affecting the customer interface.

The programming of microcomputer 22 can be best understood with reference to these general flow charts with the understanding that routine sub-sequences may be necessary to carry out the functions specified therein. Where the details of such subsequences are matters within the ordinary skill in the programming art, details will not be included herein.

Start up mode 70 is entered either upon command from the host computer H to re-initialize the terminal T or upon power failure at the terminal. In either event, control of microcomputer 22 is transferred to a bootstrap loading sequence 72 stored in memory 56, which causes microcomputer 22 to load the operating system command sequences from memory 56 to the first available address in combined memories 58 and 60. Hereinafter, various sequences will be described as controlling microcomputer 22. It should be understood that such sequences are actually part of the programmed software of microcomputer 22. Control of microcomputer 22 is then transferred to the sequence 74 thus stored in random access memory 58, 60 which causes microcomputer 22 to initialize cathode ray tube 28, printer 32 and modem M. Control of microcomputer 22 is then transferred to host auto-call sequence 76 which



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initiates a call via modem M to host H unless the start up sequence has been entered at the command of the host computer H (step 78), in which case communication has already been initiated. If the call is unsuccessful, a re-dial sequence 80 will cause microcomputer 22 to repeat the attempt every forty-five seconds. Irrespective of whether the call is successful, control of microcomputer 22 is transferred to command sequence 82 which includes command steps 84, 86 and 88 which cause the terminal T to display the first screen of advertising in the free-standing mode and to rotate to the next screen of advertisements every ten seconds. Although not illustrated in Fig. 6, it should be noted that should a customer attempt to activate the terminal T via card reader A while terminal T is operating in this start up mode, thereby causing a card reader interrupt (Fig. 5) to be provided to microcomputer 22, microcomputer 22 causes a "temporarily out of service" message to be displayed for the customer on cathode ray tube 28.

Once communication with host computer H is established (step 80), microcomputer 22 obtains date/time of day data and mode instruction (step 90) from host H. Control is then transferred to command sequences in the Ready mode (Fig. 7) or the Hide and Watch mode (Fig. 8) depending upon instruction from host computer H (step 92).

From the start up mode (Fig. 6), control of microcomputer 22 will normally be transferred to the normal customer or ready mode 100 (Fig. 7). In this mode, command sequence 102 which includes steps 104, 106 and 108, causes microcomputer 22 to display free-standing advertising screens sequentially, changing screens every ten seconds, until the terminal is activated via activator card reader A. Upon receipt of a card reader interrupt (step 110), control of microcomputer 22 is transferred to command sub-sequence 112 (BPSTSK (Fig 5.)) which causes microcomputer 22 to search memory 58, 60 to locate the coupon transaction history, if any, corresponding to the

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customer credit account number presently provided via card reader 36. If no corresponding history is located, command step 114 causes microcomputer 22 to create a new file corresponding to the new customer account number. If, on the other hand, a previous coupon transaction history is located, this data is utilized at step 116 to mask out previously selected coupons from the display if the limit of coupons per period has already been reached under this customer's account number so that requests for coupons utilizing a single account number are limited to the prescribed number of each coupon. Control is then transferred to step 118. As the customer makes selections from the displayed coupons causing a touch screen interrupt (step 120), control of microcomputer 22 is transferred to a background coupon printing command sequence 122 (BPOTSK (Fig. 5)) which causes printer 32 to print and dispense the coupons. If no touch screen interrupt has been received at step 120, control is transferred to an interrogatory command sequence 122 to determine whether the prescribed time for making a selection has elapsed. If so, control is transferred to interrogatory step 124 which causes microcomputer 22 to determine whether the last page of the menu has been displayed. If the time has elapsed and the last page has been displayed, control is transferred to step 126, which causes the transaction to be recorded and return control to the ready sequence. If the last page has not been displayed, but the customer has requested to "quit" selection, (step 128 causes control to be transferred to step 126) where the transaction is recorded and control reverts to the ready sequence awaiting the next transaction.

If at step 122, the prescribed time for making a selection has not elapsed, control is transferred to interrogatory step 130 which causes microcomputer 22 to determine whether the customer has requested the "next page" of coupons. If so, control is transferred to step



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132 which causes microcomputer 22 to retrieve the next page data and returns control to step 118 thereby causing the next page to be displayed. On the other hand, if at step 122, the time has not elapsed, and no "next page" request has been made at step 130, control returns to step 120 continuously until a selection is made or the time for selecting expires. When the customer has completed the transaction, and the coupon is dispensed, the transaction is recorded in coupon history addressed by the account number and control is transferred (step 132) back to the beginning of the ready mode where the sequence is repeated, i.e., advertising is displayed until the next customer activates the terminal and initiates the selection/dispensing sequence. While not explicitly illustrated in Fig. 7, it should be noted that the ready mode may be exited at any time response to command from the host computer H to go to the hide and watch mode, or to the start up mode or as a result of a terminal power failure or local restart.

The host computer will be programmed with over-all limits for the entire terminal so that upon such terminal reporting to the host the attainment of such limits, the host will signal command to terminal T and control of microcomputer 22 is transferred from the ready mode control sequence 100 to the hide and watch mode sequence 140 (Fig. 8). In this mode, command sequence 142 causes microcomputer 22 to display the initial page of free-standing advertising (step 144) until a prescribed time, i.e., ten seconds, has elapsed. At the expiration of the prescribed time, step 146 causes control to be transferred to step 148 to retrieve the next page of advertising and return control to display step 148. This cycle is repeated unless a card reader interrupt is received (step 148) indicating a customer attempt to activate the terminal T. If an interrupt is received, step 148 transfers control to step 150 which causes a "temporarily out of service" message to be displayed to

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the customer on cathode ray tube 28. This message is maintained for a fixed period, i.e., ten seconds, via step 152, after which control is transferred to step 154 to receive mode instructions from host computer H. If the mode has not changed, control is returned (step 156) to the beginning of the hide and watch sequence to continue displaying advertisments until another card reader interrupt is detected. If, however, an updated mode instruction has been received from host computer H via modem M, control is transferred at step 158 to the indicated mode sequence, which will either be the ready mode (Fig. 7) or the start up mode (Fig. 6).

Thus, Hide and Watch sequence 140 may be utilized by host computer H to temporarily disable an individual terminal T to prevent it from issuing coupons, either because of a detected malfunction or because the prescribed coupon limit for the terminal T has been attained.

Referring now to Fig. 9, the terminal modem operations 160 are illustrated in schematic flow chart form. In the preferred embodiment, the input (received data) interrupt of modem M (step 162) is always enabled to receive data from host computer H. Received data is automatically stored by microcomputer 22 at step 164 by the microcomputer interrupt handler. Valid input data will automatically cause control of microcomputer 22 to be transferred (step 166) to the appropriate command sequences such as 168, 170 or 172 to take any action required such as updating customer-oriented data (step 168), change mode of operation (step 170) or take other specified action (step 170) concurrently with on-going terminal operation and modem output, if any.

Microcomputer 22 will cause terminal T to initiate a call to the host computer H (step 172) under any one of three conditions:



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a) On power failure or restart, a call to a host trouble number to obtain date/time of day data is initiated (step 174);

b) On printer failure or other detectable failure, a call to a host trouble number to report an out of service condition (step 176); or,

c) At regularly scheduled intervals, or when a predesignated number of terminal transactions are recorded, to transfer coupon history and coupon counts to the host's data number (step 178).

These modem operations take place automatically and concurrently with terminal operations.

B. Detailed Description of Command Sub-Sequences

In order for microcomputer 22 to operate terminal T to achieve the desired terminal control and monitoring functions illustrated in the general flow charts of Figs. 5-9, control of microcomputer 22 is, as appropriate, transferred to one or more of the sub-sequences listed in Fig. 5 and shown in detail in Figs. 10-28.

1. The Executive Sequence

According to the operating system used in the present invention, control of microcomputer 22 generally resides in the executive command sequence E illustrated in Fig. 18. Control is automatically transferred to this executive sequence E upon completion of the power up sequence P illustrated in Fig. 19.

Sequence P is an initialization sequence which is entered when terminal T is energized. Control is transferred to step P1 which causes microcomputer 22 to transfer or boot the operating system from non-volatile memory 56 to memories 58, 60. Step P2 then transfers control of microcomputer to the operating system, and step P3 causes the microcomputer 22 and the associated peripherals (Fig. 4) to be initialized to begin the operating sequence. Control is then transferred to step P4 which causes a background task flag (BIDLE) to be set

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or posted and transfers control of microcomputer 22 to the executive sequence E (Fig. 18).

The executive sequence E runs at all times that there is no active interrupt as from one of the foreground sequences listed in Fig. 5 and described hereinafter. The executive sequence may be requested to execute any of the background service sequences shown in the program list (Fig. 18) by any other sequence which causes the particular background task flag to be posted or set. The selected background task sequence will then be executed to completion except for servicing interrupt (foreground) requests. As described above, the executive sequence is entered upon power up, with the BIDLE background task flag posted (step P4). The BIDLE task is a background idling task which is executed in the absence of other requests.

Turning now to Fig. 18, executive sequence E is entered at step E1 which causes microcomputer 22 to read the operational mode variable (initialized at step P3 to 1, and subject to control by host H) and to enable card reader 36 (Fig. 4) so that customers may activate terminal T to begin dispensing coupons.

Control is then transferred to step sequence E2 which causes microcomputer 22 to repeatedly determine whether any background task sequence flags have been posted, and to transfer control to the first posted background task. The background task sequences will be described in detail below, but each will return control of microcomputer 22 back to the executive sequence E upon completion. We now turn to a description of the priority, foreground interrupt sequences to which control is transferred upon demand.

2. The Foreground Sub-sequences

The foreground command sub-sequences illustrated generally in Fig. 5 are real-time, interrupt activated and, by definition, asynchronous. Since these sub-sequences interrupt other sequences, and may



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themselves be interrupted, any registers used by a sub-sequence must be saved on entry and restored on exit. Each of the various components of terminal T may be allowed to interrupt microcomputer 22 if enabled (see Fig. 5).

a. Card Reader Interrupt

The card read interrupt (FCRINT) sub-sequence is illustrated in Fig. 10. Control of microcomputer 22 is automatically transferred to this sub-sequence each time an interrupt from card reader 36 is received. At entry, step 180 causes microcomputer 22 to read the interrupt character to determine whether an error condition exists such as will be the case when a customer has improperly used activator A or attempted activation by improper means, or when activator A has malfunctioned.

If an error is detected, control is transferred to step sequence 182 which causes microcomputer 22 to send a "try again" message to the cathode ray tube 28 to prompt the customer to attempt another activation. Sequence 182 also includes steps 184, 186 and 188 which cause microcomputer 22 to post an alarm bit or flag upon the twelfth consecutive card reading error before returning (step 190) control to the last executed step prior to the interrupt.

Typically, no error character will be detected at step 180 and control will be transferred to step 192 which causes microcomputer 22 to determine whether the character from card reader is a start sentinel signaling the beginning of the transmission of customer primary account number data. The term primary account number is used herein to designate the number or code encoded upon the customer's credit card to identify the customer. If the character from the reader is a start sentinel, control is transferred to step 194 which initializes a pointer in the buffer register where the complete account information will be temporarily stored and returns (step 196) control to the point of departure prior to the interrupt. Since

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the card interrupt has not been disabled, the card reader interrupt will cause the next character, i.e., the first character of the account number to be read and so on until a field separator (step 198) or the twentieth character (step 200) is read, either of which marks the end of an account number, whereupon control is transferred to step 202 to disable the card reader interrupt. Thereafter, control is transferred to step 204 which causes a primary account number search flag to be posted which will in the manner described herein ultimately cause microcomputer 22 to begin searching previously entered account numbers to determine whether the present account number has been recently utilized. Step 204 also sets the terminal mode flag to indicate an account number search is in progress, then returns (step 196) control to the point of departure prior to the interrupt. In this manner, as each character prior to the field separator or the twentieth character is read, control is transferred from step 200 to step 206 which causes microprocessor 22 to store the character in the buffer initialized at step 194 until the entire account number is read and stored.

b. Interrupt from the Output to the Cathode Ray Tube (FSINT) (Fig. 11)

Referring now to Fig. 11, on each occasion when an output is provided by microcomputer 22 to UART 50 for transmitting to cathode ray tube 28, such as to display coupons, advertising or messages, control of microcomputer 22 will be transferred to sub-sequence 210. Step 212 of this sub-sequence causes UART 50 to send the next character of output data each time the sequence is entered until the last character is sent. When the last character has been sent, step 214 transfers control of microcomputer 22 to steps 216 and 218 which cause the output buffer pointer to be reset and signal that the output has been completed by setting the FPDFLG flag. Control is then returned (step 220) to the point of departure prior to the interrupt.



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c. Interrupt from Clock (FCLINT) (Fig. 12)

The clock interrupt sub-sequence 222 shown in Fig. 12 is provided to enable microcomputer 22 to maintain time of day and date and to monitor elapsed time from the occurrence of various events as set forth in the drawings. This sub-sequence is entered in response to an internally generated 60HZ clock interrupt. Sub-sequence 222 causes microcomputer 22 to increment an interrupt count (step 224) upon each entry and return (step 226) to the point of departure until sixty (60) entries have been made, i.e., one second has elapsed, whereupon control is transferred from step 228 to step 230. Step 230 causes the clock count register to be cleared and transfers control to step 232 where the seconds, minutes and hours registers of the microcomputer's internal clock are incremented as is appropriate. Control is then transferred to step 234 where the BTMTSK flag is posted to indicate that elapsed time has been incremented so that control of microcomputer 22 may be transferred to that background sub-sequence when appropriate to test for the expiration of any prescribed time limits. Where the time increment made at step 232 was the last of a full day, step 236 transfers control to step 238 to post an end of day (BEDTSK) flag prior to returning (step 226) control to the point of departure prior to interrupt. The end of day (BEDTSK) flag will cause control of microcomputer 22 to be transferred to that background sub-sequence (Fig. 28) to cause microcomputer 22 to perform specified end of day housekeeping chores.

d. Touch Screen Interrupt (FTSINT) (Fig. 13)

Once the touch screen 30 has been enabled, which in the normal course of events occurs after the terminal has been correctly activated by a customer and the first page of the menu of available coupons is displayed, any selection or other input from touch screen 30 will cause an appropriate interrupt to be generated and control of

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microcomputer 22 will be transferred to the interrupt sub-sequence 240 FTSINT illustrated in Fig. 13.

Sub-sequence 240 FTSINT is entered at step 242 which causes microcomputer 22 to store the data character transmitted via UART 50 (Fig. 4) in the touch screen buffer register then transfers control to step 244. Step 244 causes microcomputer 22 to test the touch screen buffer to determine if it is full, and if so forces internal processing by transferring control to steps 246, 248 and 250 in sequence. These steps cause microcomputer 22 to disable the touch screen interrupts (246) reset the touch screen buffer pointer (248) and set the touch screen background task flag (BTSTSK), respectively, then return (252) control of microcomputer 22 to the point of departure prior to interrupt. Setting the BTSTSK flag and disabling the touch screen interrupts causes microcomputer 22 to take up background touch screen task sequence in the manner described hereinafter to process the customer requests. If at step 244 control is transferred to step 254, step 254 causes microcomputer 22 to test the input character to determine if it is one requiring processing such as a "quit", "next page" or "hold" request. If so, control is transferred to steps 246 through 250 to force internal processing as described above. If the character does not require processing, control is returned to the point of departure prior to interrupt.

e. Printer Output Interrupt (FPOINT) (Fig. 14)

Whenever data is provided by microcomputer 22 to UART 46 for transmission to printer 32, such as when selected coupons are to be printed and dispensed to a customer, a printer output interrupt will be provided which will cause control of microcomputer 22 to be transferred to the sub-sequence 260 (FPOINT) illustrated in Fig. 14. This sub-sequence simply causes each character to be sent to printer 32 until a print command (which causes printer 32 to begin printing the coupon) is transmitted. Until a print command is transmitted, control will be transferred



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from step 262 to step 264 thereby causing the next character to be transmitted and the printer output register pointer to be incremented prior to returning (step 266) control to the point of departure prior to interrupt. If, on the other hand, a print command was the last character sent, control is transferred from step 262 to steps 268 and 270 in sequence which reset the printer output buffer pointers (268) and set a task complete (FPOFLG) flag prior to returning (266) control to the point of departure prior to the last interrupt.

f. Printer Input Interrupt (FPIINT) Fig.15)

Printer input interrupts occur when a printing transaction has been completed or a print error is signaled such as for low paper, or a time out error, i.e., where the coupon has not been printed within a prescribed maximum time limit, has occurred. Each time a printer input interrupt is provided to microcomputer 22, control of microcomputer 22 is transferred to background sub-sequence 280 (FPIINT) (Fig. 15).

Sequence FPIINT is entered at step 282 which causes microcomputer 22 to read the input character (from UART 46, Fig. 4) to determine if the printing task has been completed. In the usual case the input character will equal a prescribed value, i.e., "XON", indicating the transaction was completed routinely and control of microcomputer 22 is transferred to step 284. Step 284 causes a microcomputer 22 to set the printing task complete flag and then returns (286) control to the point of departure prior to the last interrupt. If, on the other hand, the input character is not equal to "XON", an error or alarm condition is indicated and control is transferred to step 288.

Step 288 and 290 cause microcomputer 22 to test the printer input character to determine if a time out error (XOF at 288), i.e., the printing was not completed within the specified time, or a low paper (LOP at 290) signal is being provided. In either case, control is transferred to



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the error recording steps 292, and 294 respectively which cause microcomputer 22 to set an error flag indicative of the type of error which has been reported. Control of microcomputer 22 is then transferred to step 296 which causes microcomputer 22 to post a background alarm task flag (BALTSK) and then return (298) control to the point of departure prior to the interrupt. Setting or posting the background alarm task flag will cause microcomputer 22 to take up an appropriate background task to deal with the reported printer error.

g. Modem Output Interrupt (FCOINT) (Fig. 16)

Each time microcomputer 22 provides a section of data for transmission from terminal T to host H via UART 50 and modem M, a modem output interrupt is provided by UART 50 which causes control of microcomputer 22 to be transferred to the foreground sub-sequence 300 (FCOINT) illustrated in Fig. 16. In the preferred embodiment, communications between the host H and terminal T are full duplex in blocks of 140 bytes, with ten (10) leading bytes of overhead, one hundred twenty-eight (128) bytes of data, and two (2) trailing bytes of a transmission error check. The error check variable is designated in the drawings as variable LRC. The LRC bytes represent the sum of the previous one hundred thirty-eight (138) bytes. The LRC counter will be initialized at zero when control is transferred to sub-sequence 300.

Referring now to Fig. 16, control is in the first instance transferred through steps 302, 304, 306 to step 308 since the transmission error check variable LRC is initially zero. Control will likewise be transferred through step 308 to step 310 since the hang up timer will typically not have expired. The hang up timer sequence beginning with step 308 is described more fully below.

Step sequence 310 causes the terminal T to send the next character to the host H, add the value of the character to the transmission error check variable LRC and increment the character count. Control of microcomputer



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22 is then transferred to step 312 which tests the character count to determine if the complete block of data (ten (10) leading, plus one hundred twenty-eight (128) characters) has been sent, and if not returns (314) control to the point of departure so that the above described sequence will be iterated to complete the transmission. If the complete block has been transmitted, the character count will equal one hundred thirty-eight (138), and control will be transferred from step 312 to step 316 which causes microcomputer 22 to reset the character count to zero in preparation for the next transmission and transfer control to step 318.

Step 318 causes microcomputer 22 to increment the LRC counter, i.e., from zero to one in the first instance, and then returns (320) control to the point of departure prior to interrupt. In this fashion, control of microcomputer 22 will again be transferred to sub-sequence 300 to step 302 so the LRC variable can be transmitted to complete the data transmission.

On re-entry, control will be transferred through steps 302 and 304 to step 306. Step 306 control of microcomputer 22 is transferred to step 322 which causes microcomputer 22 to increment the LRC counter, i.e., from 1 to 2, and transfers control to step 324. Step 324 causes the first byte of the LRC variable to be transmitted and then returns (326) control of microcomputer 22 to the point of departure prior to interrupt, whereupon sub-sequence 300 will normally be re-entered at step 302.

On the third entry at step 302, control will pass from step 302 to step 304 (LRC now equals 2) and to step 328. Step 328 causes microcomputer 22 to increment the LRC counter, i.e., from 2 to 3, and transfers control to step 330 to cause the second and last byte of the LRC variable to be transmitted to the host H and then returns (326) to the point of departure prior to interrupt. When control is transferred to step 302 for the fourth time in

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this sequence, LRC will equal 3, and control will be transferred from step 302 to steps 332, 334 and 336 sequentially to clear the LRC counter and the LRC variable (332), reset the modem output buffer pointer (334), and post or set a background task flag (335) in preparation for the next transmission and to signify completion of the present block. Control is then returned (338) to the point of departure prior to interrupt where, if transmission is completed, control of microcomputer 22 will be transferred to another posted background or interrupt task.

Sub-sequence 300 includes a "hang up" test sequence including steps 308, 340, 342, 344 and 346 which causes microcomputer 22 to send a "hang up" message to modem M to cause modem M to disconnect from host H. Upon initialization of an output communication to host H via modem M, microcomputer 22 causes a three second timer to be set to allow host H to respond, if necessary, to the data transmission from terminal T. If this timer has expired, indicating no return message has been received, step 308 causes control of microcomputer 22 to be transferred to steps 340-344. Step 340 causes microcomputer 22 to send a five character "hang up" command to modem M by iterating and testing the character count at step 340, and upon completion, transfer control to steps 342-346. Steps 342-346 cause microcomputer 22 to reset the character count (step 342), reset LRC variable and the three second hang up timer (step 344) and return (step 346) control to the executive sequence.

h. Modem Input Interrupt (FCIINT) (Fig. 17)

Referring now to Fig. 17, control of microcomputer 22 is transferred to the modem input interrupt sub-sequence 350 (FCIINT) in response to an interrupt from UART 54 indicating receipt of input data from host H. In this sub-sequence, control of microcomputer 22 is initially transferred to step 352 which causes a transaction timer to be set equal to two seconds then transfers control to



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step 354. Upon initial entry in this sub-sequence, reception error check variable ILRC and the character counter are equal to zero. As in the modem output interrupt sequence, in this sequence data is received in one hundred thirty-eight (138) character groups followed by the 2 byte ILRC.

Thus, upon initial entry control of microcomputer 22 is transferred from step 352 through steps 354 and 356 to step 358 which causes microcomputer 22 to store the incoming characters in sequence and add the character value to reception error detection variable LRC. Control of microcomputer 22 is then transferred to step 360. Step 360 causes microcomputer 22 to increment the incoming character counter and transfers control to step 362 which will return (364) control to the point of departure prior to interrupt the block of one hundred thirty-eight (138) characters have been received. When the entire block has been received control will be transferred from step 362 to steps 366 and 368 in sequence which cause microcomputer 22 to reset the character counter (366) and increment the ILRC counter (368) to prepare for the next data reception and cause the ILRC error detection counter to be received. From step 368 control is returned (364) to the point of departure prior to interrupt.

Upon re-entry to this interrupt sub-sequence control is transferred through steps 352 and 354 to step 356, whereupon ILRC being equal to one, control is transferred to step 370. Steps 370 and 372 sequentially cause microcomputer 22 to get the first character of the ILRC counter (372) before returning (374) control to the point of interrupt. Upon re-entry, control is transferred through step 352 to step 354 whereupon, ILRC being equal to two, control is transferred to step 376 which causes microcomputer 22 to get the second character of the ILRC variable then transfers control to the error detection sequence 378.

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Sequence 378 begins with interrogatory step 380 which causes microcomputer 22 to compare the received ILRC to the computed ILRC (step 358) to determine if they are equal. If not, control is transferred to step 382 which causes an input error flag to be set so that microcomputer 22 will be prompted to the appropriate action. If no error is detected, control is transferred from step 380 to steps 384, 386 and 388 sequentially which cause microcomputer 22 to reset the ILRC counter and timer to zero (384), reset the input buffer register pointer (386), and post or set a background sequence task flag (BCITSK) (388) before returning (390) control to the point of departure prior to interrupt.

3. The Background Task Sub-sequence

The sub-sequences described in this section are all entered from the executive command sequence E (Fig. 19) as a result of having been requested during some other functional sequence. The request is made by setting or posting the appropriate task flag. The subscript TSK for "task" is used in designating the various background sub-sequences except for BIDLE sub-sequence which is the background idle loop. The tasks that each sub-sequence performs are generally as follows:

a) BIDLE causes the microcomputer 22 to provide free-standing advertising video to cathode ray tube 28 and to rotate ads every ten seconds;

b) BPSTSK causes the microcomputer to put existing or new coupon history files in buffer BPSBFR (Fig. 13, step 242);

c) BTSTSK interprets inputs from touch screen 30, (Fig. 13, step 250), updates coupon history and count files, or the touch screen error file, queues coupon print requests, gets the next coupon screen when required, sets mode flag to 1 and updates non-volatile memory 56 when the task is completed;



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d) BTMTSK is automatically entered each second from foreground clock interrupt sequence FCLINT (Fig. 12) to service any expired timer;

e) BPOTSK causes microcomputer 22 to get the next entry from the printer queue and initiates transfer to the printer (Fig. 15, step 284);

f) BALTSK is executed in the event of printer error conditions to terminate the current printing transaction in an orderly fashion, sets operation mode to five to indicate printer failure, and posts the BCOTSK flag to cause microcomputer 22 to call the host H to report the failure; BALTSK also initiates a call to host H in the event of repeated card reader errors (Fig. 10, step 188) but without setting the operational mode to five;

g) BCOTSK causes the terminal T to initiate a call to host H, and, if a connection is already established, initiate transfer of the next data block (Fig. 16, step 336);

h) BCITSK causes microcomputer 22 to check incoming data from host H and initiates corrective action if necessary; if the input data is acceptable, BCITSK causes microcomputer 22 to perform the indicated action from host H, and also controls the data input timer and recognizes and discards the disconnect data sequence at the end of host communications.

A detailed description of the background task sub-sequences with reference to corresponding flow chart diagram follows.

a. Background Idle Loop Sequence (BIDLE) (Fig. 20)

This sub-sequence is posted upon execution of terminal power up (Fig. 19, step P4) by sequence BTSTSK entering the normal, ready condition, designated mode 1 (Fig. 22a, step 522), by sequence BCITSK entering the Hide and Watch mode designated mode 5 (Fig. 27a, steps 740, 750), by BTMTSK (Fig. 23, step 576) and reposted by BIDLE.

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This sequence causes terminal T to display successive free-standing ads on ten second boundaries.

Referring now to Fig. 20, the details of subsequence BIDLE are illustrated. Upon entry, control is transferred to step 400 which causes microcomputer 22 to determine whether terminal T is in operational modes two (coupon display or transaction) or four (commanded reboot from host H) and if so returns control to executive command sequence E. If terminal T is not in operational modes two or four, control is transferred to step 402 which causes microcomputer 22 to proceed to display the next ad in sequence only if the ten second timer has elapsed which is indicated if the value of CRT end flag is equal to one. If not, control on microcomputer 22 is transferred to step 404 to repost the BIDLE task flag and return (406) control to command sequence E.

If the ten second time for displaying the current ad has expired, control of microcomputer 22 will be transferred to step 408. Step 408 causes microcomputer 22 to get the data which comprises the next ad from memory and transfer control to step 410 to initiate transmittal of this next ad to cathode ray tube 28. Control is then transferred to step sequence 412 which causes the microcomputer to increment the next ad counter until the counter attains the prescribed maximum number designated "max ad" corresponding to the number of distinct ads stored in memory. When the next ad counter reaches "max ad", step sequence 412 causes microcomputer 22 to reset the increment counter to zero to begin the display sequence anew. Thereafter control is transferred to step 414 to reset the ten second timer for the currently displayed ad and control is returned (416) to command sequence E.

b. Customer Account Number Search Task (BPSTSK) (Fig. 21)

This sub-sequence is posted in response to customer activation of terminal T with a credit card having a primary account number (PAN) encoded upon magnetic tape



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which has been read by card reader 36 and stored in a buffer register in random access memory 58, 60 (Fig. 10, steps 204, 206). This sub-sequence essentially searches previously used account numbers to determine if the present account number has been used to activate the terminal to dispense coupons within a prescribed time period, i.e., the last week, and if so, limits the coupons dispensed to that account number to a prescribed maximum by preventing previously selected coupons from being displayed on cathode ray tube 28 for selection. It should be understood that the prescribed maximum number of a particular coupon to be dispensed could be set equal to one, two or more, but most typically will be one. If the account number presented to microcomputer 22 via card reader 36 is new, i.e., not having been previously used within the specified period, it is stored in a random access memory 58,60 file, designated temporary PANFIL, and in non-volatile memory 56 and a full menu of coupons is displayed for the customer.

Referring now to Fig. 21, the details of sub-sequence BPSTSK are illustrated. Upon entry, steps 420 and 422 cause microcomputer 22 to convert the ASCII format account number read from the present customer card to binary coded digital (BCD) for the purpose of comparing it to previously used account numbers stored in memory. Control is then transferred to step 424 which causes microcomputer 22 to initialize a counter corresponding to the number of search attempts (# of tries) and the "next account" pointer to zero. Control is then transferred to step 426 to begin a sequential search of the primary account number file (PANFIL) for previously used primary account numbers.

Step 426 causes microcomputer 22 to stop searching for a matching account number when all previously used and stored account numbers have been compared, by comparing the # of tries counter to the primary account number counter (PAN CNT) which equals the total number of primary account numbers stored in memory. Typically this test

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will fail and control will be transferred to step 428 which causes microcomputer 22 to compare the present primary account number to the one stored at the address identified by the "next" pointer, and if unequal, transfers control to step 430 to increment the "next" pointer and "# of tries" counter and returns control to step 426. This search is repeated until all previous primary account numbers are compared (exit at step 426) or the present account number is located in memory (exit step 428).

If the principal number is new, the "# of tries" counted will eventually be incremented to equal the account counter "PAN CNT", and control of microcomputer 22 will be transferred from step 426 to step 432. Step 432 causes microcomputer 22 to set a "new" account flag and transfers control to step 434. The current account numbers are maintained in a primary account number file (PANFIL) stored in random access memory 58, 60 to facilitate searches for account numbers in a random access memory file without having to search coupon history data as well. Step 434 transfers control of microcomputer 22 to steps 436 and 438 to cause the new primary account number to be stored in this primary account number file in random access memory 58, 60 (step 436) and the primary account number counter to be incremented (step 438) if the file is not full (step 434). If, on the other hand, the primary account number file is full, control is transferred from step 434 to step 440 to increment the primary account number overflow flag. Once the primary account number counter PAN CNT is incremented to four thousand ninety-six, step 442 transfers control of microcomputer 22 to step 440 to increment the file overflow flag. When an overflow condition arises, terminal T will continue to dispense coupons in the normal manner, but the new account numbers and histories will be written over the oldest account numbers and histories in memory. Step 440 causes microcomputer 22 to increment the

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overflow counter in order to maintain a count of the number of overflow transactions. In any event, the count of the number of coupons dispensed is maintained in memory despite the overflow condition.

Whether an overflow condition exists or not, control of microcomputer 22 will be transferred from either step 440 or 442 to step 444 which causes microcomputer 22 to read the address (Logical Bit Number) corresponding to the data sector in memory which contains the most recently entered coupon history data into the primary account buffer. This address will be used by microcomputer 22 to retrieve the coupon history from memory to use as a mask to prevent display of previously selected coupons in subsequent transactions. The new account number is read into the primary account buffer later, at step 458.

Control of microcomputer 22 is then transferred to step 446 which calculates the current increment of the data sector where the new account number is to be stored, and sets the value of variable PAN INC equal to the current increment. Control is then transferred to steps 450, 452 and 454 which cause microcomputer 22 to test the current increment value (step 450) and if equal to eight, reset the current increment to zero (step 452). In the illustrated embodiment, data sectors comprised of eight increments are used and therefore sub-sequence steps 450-454 cause microcomputer 22 to maintain a count of the current increment up to eight and then reset to begin counting again. Each time the count reaches eight, the sector in use has been filled and accordingly the logical bit number is incremented to correspond to the next sector to be used (step 454). Thereafter, control of microcomputer 22 is transferred to steps 456 and 458 which cause microcomputer 22 to set variable "allowed coupon" to the initial count since this is the initial use of the

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current primary account number and store the primary account number in the appropriate buffer (step 458). Control is then transferred to step 460 which causes microcomputer 22 to enable the touch screen interrupt so that coupon selections may be made by the customer. Control is then transferred to step 462 to post background touch screen task (BTSTSK) and returned (464) to the point of departure prior to interrupt.

Returning now to step 428, and assuming the customer's primary account number is found in the primary account number file in random access memory 58, 60, control of microcomputer 22 will be transferred from step 428 to step 466. Step 466 causes microcomputer 22 to read the coupon history corresponding to this account number into pan buffer for use as a mask in the manner described hereafter to prevent the display of previously selected coupons. Control is then transferred to step 468 which causes microcomputer 22 to determine the increment into the pan buffer where the present account number and coupon history are located and retain the location by setting the value of variable PAN INC. The search task then being completed, control of microcomputer 22 is then transferred to steps 460 which causes microcomputer 22 to disable the card reader interrupt and to enable the touch screen interrupt, then transfers control to step 462 which causes microcomputer to post background touch screen task flag (BTSTSK) before returning (464) control to the point of departure prior to interrupt.

This sequence BPSTSK has caused the microcomputer to record the primary account number in the primary account number buffer with "zeros" for an account history thereby allowing full coupon selection if the number was a "new" account, and recalled the coupon history into the principal account buffer to be used as a mask to prevent full selection in the case of previously used account numbers.

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c. Touch Screen Task (BTSTSK) (Fig. 22a-c)

This background task sequence has three entry points and for ease of reference is illustrated in separate Figs. 22a, 22b and 22c, respectively. The first entry from task BTMTSK (Fig. 23), is used to mask previously dispensed coupons from the touch screen and cathode ray tube display and to send the modified display to cathode ray tube 28. The record entry from background task FTSINT (Fig. 13, step 250) is used for causing microcomputer 22 to accept touch screen entries, and the third entry, from background task BPSTSK, is used for initializing sequence pointers to rotate the order of appearance of the screens to the customer.

When control of microcomputer 22 is transferred to this sequence from sequence BTMTSK, entry is at step 470 (Fig. 22). Step 470 causes microcomputer 22 to display a background of blank coupons on cathode ray tube 28 which will be completed with alpha numerics at step 488 and transfers control to step 472. Step 472 causes microcomputer 22 to increment a "screens presented" counter so that only the correct number of screens will be presented to the customer on any given transaction. On the first execution the increment will be from zero to one, and so on until the maximum number has been reached. Control is then transferred to step 474 which causes microcomputer 22 to test the screens presented counter versus the prescribed maximum, and if the maximum number has been exceeded treats the transaction as a "quit" request, as described below. If the maximum number of screens have been presented, control of microcomputer 22 is transferred from step 474 to sub-sequence Q (Fig. 22a) which will be described below. If all the screens have not been presented to the customer, control is transferred from step 474 to step 476 to continue the display sequence. Control is transferred sequentially from step 476 through step 484 to cause microcomputer 22 to determine which screen is to be displayed next (476) and

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to filter the displayed video for the cathode ray tube and the touch screen to eliminate any coupons no longer available for selection.

Step 476 causes the microcomputer 22 to determine which screen of coupons is to be displayed next by reading the "NXTSCN" counter, then transfers control to step 478 which causes the microcomputer to retrieve from memory the coupon history for this customer and this screen of coupons then transfers control to step 480. Step 480 causes microcomputer 22 to compare the coupon usage to the prescribed coupon per customer limit and filter or remove any coupons which are not available by disabling the corresponding touch pads. Control is then transferred to step 482 and 484 which similarly cause microcomputer 22 to eliminate any coupons which are invalid (step 482) by disabling or filtering the corresponding touch pad(s) and to similarly eliminate any coupons which are not available because weekly or other periodic maximum limits (as distinguished from per customer limits) have been attained (step 484).

Control of microcomputer 22 is then transferred to step 486 which causes microcomputer 22 to filter the video screen of coupons to match the modified touch pad array or touch screen so that unavailable coupons will not be displayed. Control is then transferred to step 488 to initiate display of the alpha numeric characters on the background of blank coupons (step 470) for each valid, available coupon on cathode ray tube 28. Control is transferred to steps 490 and 492 which cause microcomputer 22 to start the ten second timer for displaying the screen of coupons (490) and to increment the next screen counter. Control then transfers to loop 494 which causes microcomputer 22 to reset the next screen counter to zero once the total available screens have been displayed prior to returning (496) control to executive sequence E.

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When BTSTSK is entered from the touch screen interrupt sequence FTSINT, control of microcomputer 22 is transferred to step 500 (Fig. 22b). Steps 500 through 508 cause the microcomputer to determine the nature of the touch screen input and transfer control appropriately.

If the touch screen input is a next screen request (step 500) control is transferred to BTMTSK entry A (Fig. 22a) to cause the next screen of coupons to be displayed immediately. If the touch screen input is a hold request (step 502) control is transferred to step 503 to cause the microcomputer 22 to reset the coupon display timer (step 490, Fig. 22a) to permit the present coupon screen to be displayed another ten seconds. If the touch screen input is determined to be a pad error, i.e., a malfunctioning touch screen pad (step 504) control is transferred to step 505 to cause microcomputer 22 to record the malfunction in an appropriate register and return to the executive sequence E.

If the customer has touched an invalid pad, i.e., one underlying a blank space on the display (step 506) control is returned to the executive sequence E since further action is unnecessary. Finally, if the touch screen input is a quit request, (step 508) control is transferred to sub-sequence Q (Fig. 22a).

Upon entry to sub-sequence Q, either from step 508 at the customer request or from step 474 when all screens have been displayed and selection completed, sequence Q causes microcomputer to perform the following end of transaction functions:

i. Write the primary account number data from random access memory file to non-volatile bubble memory 56 if this transaction was initiated with a new account number (steps 510, 512);

ii. Update the coupon counter in non-volatile memory 56 (step 514);

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iii. Update the not sent sector, i.e., the transaction data not yet sent to host H, in non-volatile memory 56 (step 516);

iv. Update the coupon history increments or pointers in non-volatile memory 56 (step 518);

v. Update the coupon history sector in non-volatile memory 56 (step 520);

vi. Reset the buffer pointers, disable the touch screen interrupt, and enable the card reader interrupt to place the terminal in mode 1 condition, i.e., ready to be activated (step 522);

vii. Post the background idle task BIDLE and return to executive sequence E (step 524) unless the not sent sector of non-volatile memory is full (step 526) in which case background task sequence BCOTSK is posted (step 528) prior to returning to cause microcomputer 22 to take appropriate action.

Returning now to Fig. 22b, and assuming the touch screen input is a valid coupon selection input, control of microcompuer 22 passes to step sequence beginning with step 530 which causes the microcomputer 22 to initiate dispensing the selected coupon by queuing the selected coupon data into the printer output buffer and posting the printer output background sequence task BPOTSK (steps 530, 532). Thereafter control is transferred to steps 536 and 538 which cause the microcomputer to disable the touch pad(s) corresponding to the selected coupon (step 536) and update the coupon history and counts in random access memory 58, 60 (step 538). Control is then transferred to steps 540 and 542 which cause the microcomputer 22 to determine whether the maximum number of this coupon have now been dispensed (step 540) and, if so, to correct the touch screen mask to clear the selected coupon from the



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video display (step 542). Control is then transferred to step 546 to set the display timer (Fig. 22a, step 490) to provide a ten second display of the available coupons then returned to executive sequence E.

Entry into background touch screen task BTSTSK from task sequence BPSTSK (Fig. 21, step 462) causes control to be transferred to step 550 (Fig. 22c). This step sequence is simply an initialization sequence to cause microcomputer 22 to rotate the order of appearance of the coupon screens and initialize the screen counter (step 550), and next screen counter (steps 552, 554) prior to using background task sequence BTMTSK entry A (fig. 22a) to display the appropriate screen of coupons. Note that steps 556 and 558 cause the microcomputer to determine whether the last screen, i.e., the fourth screen, has been displayed in this transaction (step 556) and, if so, reset the first screen counter to zero (step 558) which will cause the screen display sequence to begin anew. In either event, control is transferred to step 558 which sets the terminal operating mode to mode 2 to place the terminal in condition for a coupon transaction, prior to exiting to entry A in sequence BTMTSK (Fig. 22a).

d. Timer Task (BTMTSK) (Fig. 23)

This background task sequence (Fig. 23) is posted every second by the clock interrupt FCLINT (Fig. 12, step 234) and posts appropriate background task sequences if a timer has expired. In addition, time task BTMTSK also posts task BCOTSK at the time specified to initiate data transmission to the host H. All timed functions are listed in a timer register corresponding to the timed task. Each time the particular task is begun, the corresponding timer is set by the task sequence which provides an input value to the timer list. Entry into sequence BTMTSK causes control of microcomputer 22 to be transferred to step 570 which causes microcomputer 22 to decrement any positive timer entry.

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Thereafter control is transferred to steps 572, 574 and 576 to cause microcomputer 22 to determine whether any of the listed timers have expired (step 572), and, if so, to set the timer to a negative value to prevent subsequent repetitive time outs (step 574) and to activate (step 576) the corresponding timer executive sequence task (Fig. 18) so that appropriate action may be taken. If no timer has expired, control is transferred from step 572 directly to step 578. Steps 578, 580 and 582 cause microcomputer 22 to increment the data transfer time which equals the elapsed time since the last transfer of coupon transaction data to host H (step 578), test the elapsed time versus the specified period for making scheduled data transmissions (step 580), and if the time has expired (step 582) post background task sequence BCOTSK which initiates a call to the host for data transmission. Thereafter control of microcomputer 22 is returned either from step 580 or 582 to the executive sequence E.

e. Printer Output Task (BPOTSK) (Fig. 24a)

The printer output task BPOTSK may be posted from the BTMTSK sequence (Fig. 23, step 576) in which case entry is at the step sequence illustrated in Fig. 24a, or from the BTSTSK (Fig. 22b, step 532) or FPIINT (Fig. 15, step 284) sequences in which case entry is at the step sequence illustrated in Fig. 24b. Printer output task BPOTSK generally is used to cause the requested coupons to be printed and dispensed with the specified expiration date or other such data and to monitor printer errors.

Referring now to Fig. 24a, entry to BPOTSK from BTMTSK occurs when printer 32 has failed to send a coupon cut signal during a coupon dispensing transaction. The sequence illustrated in Fig. 24a causes microcomputer 22 to monitor printer 32 by providing a six (6) second time period for printer 32 to send the coupon cut signal indicating the transmitted coupon has been dispensed.

Upon initial entry into this sequence, control of microcomputer 22 is transferred to step 590. Step 590



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causes microcomputer 22 to test the state of the timer flag. If the timer flag is not set, control of microcomputer 22 is transferred to steps 592-596 which cause microcomputer 22 to set the timer flag (step 592), prescribe a six second time limit (step 594) and initiate the same printer transfers (step 596). If, at step 590, the timer flag has already been set, an error message is required and control is transferred to steps 598-602 which cause microcomputer 22 to clear the timer flag (step 598), set the Time Out bit in the error word register (step 600) and post background task BALTSK (Step 602) to cause appropriate action to be taken regarding the error. Control is in either case returned (step 604) to the executive sequence.

If the entry into BPOTSK is from the touch screen task, BTSTSK, or from the printer interrupt task, FPIINT, control of microcomputer 22 is transferred to step 610 (Fig. 24b). This sequence is entered to initiate printer output such as to provide the customer with the selected and authorized coupons. Upon entry, steps 610-614 cause microcomputer 22 to clear time out and X off error bits from prior transactions (step 610), clear already called and timer flags likewise set from prior transactions (step 612) and to cancel the previous time entry (step 614).

Control is then transferred to step 616 which causes microcomputer 22 to test the printer queue to determine if any coupons remain to be printed. If not, no further action is required and control is returned (step 618) to the executive sequence.

If, on the other hand, coupons remain in the printer queue to be printed, control of microcomputer 22 is transferred from step 616 to steps 620-628 which cause the microcomputer to decrement the remaining in queue variable and retrieve the next increment of coupon data (step 620), increment the next read pointer to point to the address of data which comprises the next coupon to be printed in accordance with the customer's request, (step 622),

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transfer the coupon print file to the printer output buffer from non-volatile memory 56 (step 624), insert extra data such as an expiration date data if requested (step 626), and initiate transfer of the data to printer 32 under a six second time limit (step 628). The transaction is then completed and control is returned to the executive sequence (step 630).

f. Alarm Task (BALTSK)

Alarm task BALTSK is posted in response to terminal malfunctions or alarm conditions such as from the printer input interrupt sequence FPIINT (Fig. 15, step 296), the card reader interrupt sequence FCRINT (Fig. 10, step 188), or the printer output task BPOTSK (Fig. 24a, step 602). Alarm task BALTSK causes the microcomputer 22 to initiate a call to the host H and, in some circumstances place the terminal T in a disabled, hide and watch mode.

Upon entry into the BALTSK sequence, control of microcomputer 22 is transferred to a series of interrogatory steps (632-636) which cause microcomputer to determine whether the cause of entry was a X off error (step 632), a time out error (step 634), or a low paper error (step 636). If either a X off or time out error is detected, indicating printer failure, control is transferred to step 638 to cause microcomputer 22 to initiate a call to the host and place the terminal in the disabled, hide and watch mode.

Step 638 causes the microcomputer to determine whether the host has already been called by reading an appropriate flag, and if so returns (640) control to the executive sequence in the disabled mode. If the call has not been made, control is transferred to steps 642-648 which cause the microcomputer to set the already called flag (step 642), post call out task BCOTSK (step 644), set the terminal mode to the disabled, hide and watch mode (step 646), and set a sixty (60) second time for printer output task BPOTSK to schedule evaluation in sixty seconds

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(step 648). Control is then returned (step 680) to the executive sequence in the disabled mode.

g. Data Transmission to Host H

Control sequences for microcomputer 22 cause the microcomputer to initiate calls from terminal T at regularly scheduled times, i.e., every six hours, and whenever the full capacity in non-volatile memory 56 allocated for coupon history data is exhausted. Since the host H may only have a limited number of communication lines, so that a particular terminal T may receive a busy signal when a call is attempted, control sequences are provided to redial at the expiration of a fixed time period, e.g., 45 or 60 seconds.

Each time terminal T completes a call to host H, microcomputer 22 will cause the terminal T to send all coupon history information from memory 56 to the host H. The host H will recognize the data from a particular terminal T and record and segregate the data which comprises the particular terminal's coupon history so that it may be accessed by terminal identification number.

After all the coupon history data has been sent, microcomputer 22 will cause terminal T to transmit the coupon count data which is the cumulative count of coupons dispensed by the terminal during the reporting period by coupon type. The terminal's mode and error messages will also be transmitted. Each terminal will also originate a call to the host whenever there has been power-up reboot, or low paper, X off or time out condition at the printer. Coupon transaction data will be transmitted to the host H on these occasions also.

h. Communications Output Task (BCOTSK)

The communications output task will be posted to initiate transfer of data from terminal T to host H in one of six ways:

1. When the not sent buffer of terminal T which stores coupon transaction data not yet sent to host H (Fig. 22a, step 528) is full, microcomputer 22 causes

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terminal T to indicate transfer of coupon history data and coupon counts one sector at a time from the not sent buffer;

2. By foreground communcations output interrupt FCOINT to initiate the transfer of the next sector of coupon data (Fig. 16, step 336);

3. By background alarm task BALTSK to initiate a call to host H to report a printer or card reader failure (Fig. 25, step 644);

4. By the power up sequence P (Fig. 19, step P1; Fig. 6, step 76) to obtain current date/time prior to assuming on-line, ready condition;

5. By the background end of day task BEDTSK (Fig. 28, step 816) for housekeeping transmissions; and,

6. By background communications interrupt task BCIITSK in response to a request from the host (Fig. 27b, step 802).

Each communicated data sector includes a type block which identifies the type of communication. In the illustrated embodiment, types 1-12 are communications from host H, types 20-26 are from terminal T to host H and type zero is either way.

Terminal block types may, for example, include the following:

1. Type 20: Not sent coupon history data consisting of up to seven coupon histories updated by terminal transactions;

2. Type 21: Coupon type count of the number of coupons of each coupon type issued since the last reset; may also include various error words;

3. Type 22: Date/time request calls host after reboot to obtain date/time;

4. Type 23: Printer failure, i.e., the terminal printer has an error condition which has caused microcomputer 22 to place printer 32 in the disabled mode;

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5. Type 24: Low paper in printer.

6. Type 25: Excess card reader errors, indicative that there have been twelve bad reads from card reader 36;

7. Type 26: End of day transmission, where coupon type counts are sent as final, and daily counts are reset.

Host to terminal block types may include the following:

1. Type 1: Commands terminal T to go to ready mode; terminal obeys if printer not failed;

2. Type 2: Commands terminal T to go to disabled, hide and watch mode;

3. Type 3: Commands terminal to prepare for coupon data update by going to disabled mode, transferring current not sent histories and coupon counts, and reset account file, history file pointers and counters;

4. Type 4: Commands terminal to alter terminal identification and date/time, in response to terminal request;

5. Type 5: Same as 4 except no change in terminal identifier;

6. Type 6: Commands terminal to reboot, used to update coupon data;

7. Type 7: Commands terminal to write transmitted date into non-volatile memory;

8. Type 8: Commands terminal to modify coupon count assignment, and to change the maximum number of a particular coupon to be dispensed;

9. Type 9: Provides terminal with beginning limits for dispensing coupons;

10. Type 10: Requests that terminal T send not sent histories and coupon count data.

The host H may transmit data to the terminal T at any time during a connection by changing a communications block type recognized by the terminal to signal a type of

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host command. Terminal T will receive these commands and accomplish the specified tasks.

Having these general communications types in mind, the background communications output task BCOTSK illustrated in Fig. 26 is readily understood. Control of microcomputer 22 will be transferred to BCOTSK sequence as a result of one of the six posting possibilities. If entered from sequence BALTSK control is transferred to step 700 which causes the microcomputer 22 to set the type block which corresponds to the particular alarm or error condition, and transfers control to step 702. Step 702 causes microcomputer 202 to get the type count information from memory and transfers control to step 704 to initiate the data transfer.

If entered after power up, control is transferred to steps 706, 702 and 704 which causes microcomputer 22 to set the type block to type 22 to request the host to provide date/time information (706), get the coupon count information (202) and initiate the transfer (704).

If entered from any of the remaining four possibilities (Fig. 26) control is transferred to step 710 which causes microcomputer 22 to determine if there are any not sent history sectors in the buffer and if not transfers control to steps 712, 702 and 704 which cause microcomputer 22 to set the type block for type counts (712), get the type count data (702) and initiate the transfer (704).

If on the other hand, at step 710, it is determined that there are not sent coupont history sectors, control is transferred to steps 714, 716 and 704 to set the not sent type block (714), get the next not sent sector to transfer (716) and initiate the transfer (704). After each sequence control is returned (720) to the executive sequence.

i. Terminal Control Via Host -
Communication Input Task (BCITSK) (Fig. 27)

The communications input task BCITSK is posted whenever an error free input communication is received



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from host H so that microcomputer 22 will cause terminal T to interpret the message and comply with the host commands. With the above enumerated block types designated to identify particular commands, the input task sequence is simply a series of interrogatories to identify block type and cause the terminal to carry out the commands accordingly.

Referring now to Fig. 27, upon entry to BCITSK, control is transferred to step 730 which evaluates the command block type, and, if block type 1, transfers control to steps 732 and 734 which cause microcomputer 22 to place the terminal in the ready, on line mode (step 734) unless printer 32 has failed (step 732) in which case the command to go to ready is ignored.

If the communication is a block type 2, control will be transferred through step 730 to step 736 and then steps 738-742. Steps 738-742 cause microcomputer 22 to determine whether a coupon transaction is in progress (step 738), and, if so, terminate the transaction (step 742), but in any event, places the terminal T in the disabled, hide and watch mode (step 740).

If the communication is a block type 3, control will be transferred through steps 730 and 736 to step 744 and then to step 746-758 as is appropriate. Steps 746-750 cause microcomputer 22 to terminate any coupon transactions in process, and go to the disabled mode. Steps 752 and 754 cause microcomputer 22 to send any not sent coupon histories. Step 756 and 758 cause microcomputer 22 to send the type counts and initialize internal counters and pointers.

If the communication is a type 4, control is transferred to step 760 and then to steps 762-768 which cause microcomputer 22 to update the terminal identifier (stpe 762), set the date/time data (step 764), determine if a printer failure has occurred (step 766) and, if so, set the appropriate printer failure mode 6 flag (step 768).

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If the communication is a type 5, control is transferred to step 770 and then to step 764-768 as described above thereby causing microcomputer 22 to obtain date/time data and perform a printer error check without changing the identifier for terminal T.

If the communication is a type 6, control is transferred to step 772, then to steps 774-778 which cause microcomputer 22 to terminate any coupon transactions in process (steps 774-776) and transfer control to the boot, block type 11 sequence.

Type 7 communications cause control to be transferred to step 780 and then to steps 782-782. Type 7 is a non-volatile memory write command and steps 782 and 784 cause microcomputer 22 to prevent writing in the addresses reserved for the operating system (step 782) but otherwise to write the new data as instructed (step 784).

Type 8 communications cause control to be transferred to step 786 and then to steps 788-794 as is appropriate. Steps 788 and 790 cause the microcomputer 22 to invalidate a current coupon if the host specifies a zero allotment, and steps 792-794 otherwise cause existing coupon allotments to be adjusted according to the command.

Type 9 commands cause control to be transferred to step 796, and then to step 798 to cause microcomputer 22 to boot in or load the data being transferred from the host H to set up new coupon allotments and account allotments and to receive a new coupon array for display.

Type 10 commands are requests for the terminal T to call the host H and cause control to be transferred to step 802 to post the BCOTSK sequence to initiate the call. After each communication is evaluated and executed control is returned to executive sequence E.

j. End of Day Task (BEDTSK)

In addition to those service programs or tasks listed in Figs. 5 and 19, an end of day background task illustrated in Fig. 28 is provided to cause terminal T to perform certain housekeeping chores at the end of each



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operating day. This task sequence is posted by the timer task, BTMTSK, at the expiration a of twenty-four hour period plus ninety seconds.

Referring now to Fig. 28, upon entry control of microcomputer 22 is transferred to step 804 which causes microcomputer 22 to increment the Julian date to the next day. Thereafter, control is transferred to step sequence 806-812 which cause microcomputer 22 to reset Julian date to 1 at the end of the year, i.e., the 366th day, unless the current year is a leap year. Control is then transferred to steps 814 and 816 which causes microcomputer 22 to reset the end of day timer (step 814) and initiate an end of day call to the host (step 816). Control is then returned to the executive sequence E.

Since implementation of a command control sequence for the host H, given the specifications for terminal T and the communications format contained herein is a matter within the ordinary skill in the art, detailed programming sequences for host H need not be proivded herein.

V. Conclusion

The system of the present invention thus provides an unattended stand alone terminal T for controlling and monitoring the distribution of coupons at a remote location in cooperation with a centrally located host computer H. Once the terminal T is energized and operating it monitors and controls the printing and distribution of coupons in accordance with prescribed operating criteria, coupon limits and customer requests. The terminal T displays and automatically rotates free standing advertisement screens between customer transactions and when in a disabled mode. The terminal T may be activated to the coupon dispensing mode by any customers having a common credit card bearing a primary account number encoded on magnetic tape. In response to a valid activation, terminal T displays only those coupons available for selection to the customer at that time. The data encoded upon the coupons which are dispensed provides

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the manufacturer with a means to monitor and control fraudulent redemption. Customer account numbers and coupon transaction data are recorded, identified and automatically transferred to the host at periodic intervals.

While the preferred embodiment of this invention relates to manufacturers' coupons, it should be understood that other segments of information which can be displayed and withdrawn from a terminal by choice and which need to be controlled as to information continued and in number of dispensed segments are within the scope of the distribution system disclosed herein and hereinafter claimed.

In addition, host H is programmed to accommodate coupon dispensing history from each terminal on a terminal-to-terminal basis as well as a particular coupon-by-terminal and coupon by all terminals basis. Recording of this information on a periodic basis provides the host with the available information to provide meaningful coupon history reports to manufacturers which can be used to verify actual coupon redeemed information as well as provide meaningful market information on a per store, per terminal, per all terminal basis.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made without departing from the spirit of the invention.

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CLAIMS:

1. A system for controlling the selection and dispensing of product coupons at a plurality of remote terminals located at predesignated sites such as consumer stores wherein each terminal comprises:

activation means for activating such terminal for consumer transactions;

display means for displaying a plurality of coupons available for selection;

selection means provided to permit selection of a desired coupon by the consumer;

print means for printing and dispensing the coupon selected; and,

control means for monitoring each consumer transaction and for controlling said display means and print means in accordance with prescribed coupon criteria.

2. The system of claim 1, wherein said activation means comprises means for reading encoded consumer identifier cards, and means, responsive to said card reading means, for forming a terminal display activation signal.

3. The system set forth in claim 1, including:

said control means interacting with said display means to provide means for displaying an array of individual coupons on a page formatted video menu.

4. The system set forth in claim 3, including:

means for sequentially displaying a plurality of video menu pages.

5. The system set forth in claim 3, further including:

means for displaying video graphics other than coupons such as advertisements or the like.

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6. The system set forth in claim 3, including:

means for automatically displaying each of said video menu pages for a particular time period.

7. The system set forth in claim 3, wherein said control means includes means for modifying the sequence in which said menu pages are displayed.

8. The system set forth in claim 7, including:

said control means and display means interacting to provide means for holding a particular menu page in display format for an additional period of time.

9. The system set forth in claim 7, including:

said control means and display means interacting to provide means for causing the immediate display of the next menu in sequence.

10. The system set forth in claim 3, wherein said control means includes means for modifying the displayed array of coupons.

11. The system set forth in claim 2, wherein:

said control means includes means for preventing the display of particular coupons in response to activation by a particular credit card.

12. The system set forth in claim 2, wherein said control means includes:

coupon limit means for prescribing a maximum distribution number for each coupon to set a limit on the number of that coupon that is dispensed in a particular time period; and display masking means for preventing the display of those coupons for which the prescribed distribution limit has been attained.

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13. The system set forth in claim 2, wherein said control means further comprises:

transaction storage means for storing a record of each transaction, said transaction record including a customer account identification number and data reflecting the type and number of coupons dispensed in the partaicular transaction.

14. The system set forth in claim 13, wherein said control means further comprises:

means for prescribing a particularized per account limit for each coupon;

means for comparing each customer account number read by said card reading means to the customer account numbers previously stored in said transaction storage means; and,

means for masking the display of any coupon for customer selection for which the per account limit number of coupons have been previously dispensed.

15. The system set forth in claim 13, wherein each of said terminals is associated with a centrally located data processing unit, and wherein said terminal further comprises:

data transmission means for transmitting the stored transaction data to the central data processing unit.

16. The system set forth in claim 15, wherein said data transmission means further comprises:

means for automatically initiating the transmission of the transaction data at regular periodic intervals.

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17. The system set forth in claim 15, wherein said data transmission means further comprises:

means for automatically initiating the transmission of the transaction data stored in said record storing means when the storage capacity of said record storing means is attained.

18. The system set forth in claim 17, wherein said record storing means further comprises:

means for recording the number of customer transactions for which no record is stored in said record storing means.

19. The system set forth in claim 12, wherein said selection means includes:

a touch sensitive screen comprising an array of touch sensitive elements and mounted with said display means for permitting a customer to select a particular displayed coupon by touching said elements of touch sensitive screen at points aligned with the particular coupon; and wherein said control means further comprises touch screen disabling means for disabling those elements of said touch screen aligned with masked coupons.

20. The system set forth in claim 1, wherein:

said display means includes means for displaying an array of individual coupons on a selectable video page formatted menu and means for displaying a plurality of video menu pages in a particular sequence, each page being displayed for a particular time;

said section means providing for the selection of a desired coupon in cooperation with said control means includes a touch sensitive screen mounted with said display means allowing a customer to select a particular displayed coupon by touching said touch sensitive screen at points aligned with the particularly desired coupon.

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21. The system set forth in claim 1, wherein said print means includes:

means for printing and dispensing a coupon bearing a product name, manufacturer, and the amount of discount to be applied to the purchase price.

22. The system set forth in claim 1, wherein said print means includes:

means for printing and dispensing a coupon bearing an encoded unique store identification number, Julian date, and time of day.

23. The system set forth in claim 1, wherein said print means includes:

means for printing and dispensing a coupon bearing an expiration date.

24. The system set forth in claim 1, wherein said print means includes:

means for printing and dispensing a coupon bearing a machine readable uniform product code.

25. The system set forth in claim 1, wherein said print means includes:

means for forming a signal indicative of a printer failure; and

said control means includes means responsive to said printer failure signal for placing said terminal in a standby mode wherein said selection means is inoperable.

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26. A system for controlling the selection and dispensing of product coupons at a plurality of remote terminals located at predesignated sites such as consumer stores, comprising:

a plurality of free standing coupon display terminals located at predesignated sites such as consumer stores, each of said terminals being adapted for bidirectional data communication with a host central processing unit;

each of said terminals including activation means for activating such terminal for consumer use by insertion of a credit card or other card having customer account information stored on a magnetic strip, display means for displaying a plurality of coupons, means providing for the selection of a desired coupon by a consumer, print means for printing and dispensing the coupons selected, terminal control means for continuously monitoring each customer transaction and for controlling said display and print means in response to prescribed criterias;

said host central processing unit including means for the transmitting to each terminal particular information for each coupon;

said host central processing unit further including means for transmitting to each terminal coupon limit criteria such as and including expiration date, and total number of coupons to be dispensed.

27. The system set forth in claim 26, wherein:

each of said terminals includes means for recording each customer transaction and for communicating customer transaction information to host computer.

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28. The system set forth in claim 26, wherein said terminal control means includes:

means for preventing the display of a coupon in response to activation of said terminal by a customer if the limit number of coupons for such customer has been attained.

29. The system set forth in claim 26, wherein said printer means includes :

means for preventing the display of a coupon in response to activation of said terminal by a customer if the limit number of coupons for such terminal has been attained.

30. The system set forth in claim 26, wherein said terminal control means includes:

means for preventing the display of a coupon in response to activation of said terminal by a customer if the limit number of coupons for the system has been attained.

31. The system set forth in claim 26, wherein said terminal control means includes means for transmitting to said host central processing unit transaction information including customer account numbers, and an accounting of coupons printed and dispensed.

32. The system set forth in claim 26, wherein:

said host central processing unit includes means for compiling transaction information provided from each of said terminals and for reporting transaction information on a periodic basis for all terminals, for individual terminals and individual coupons.

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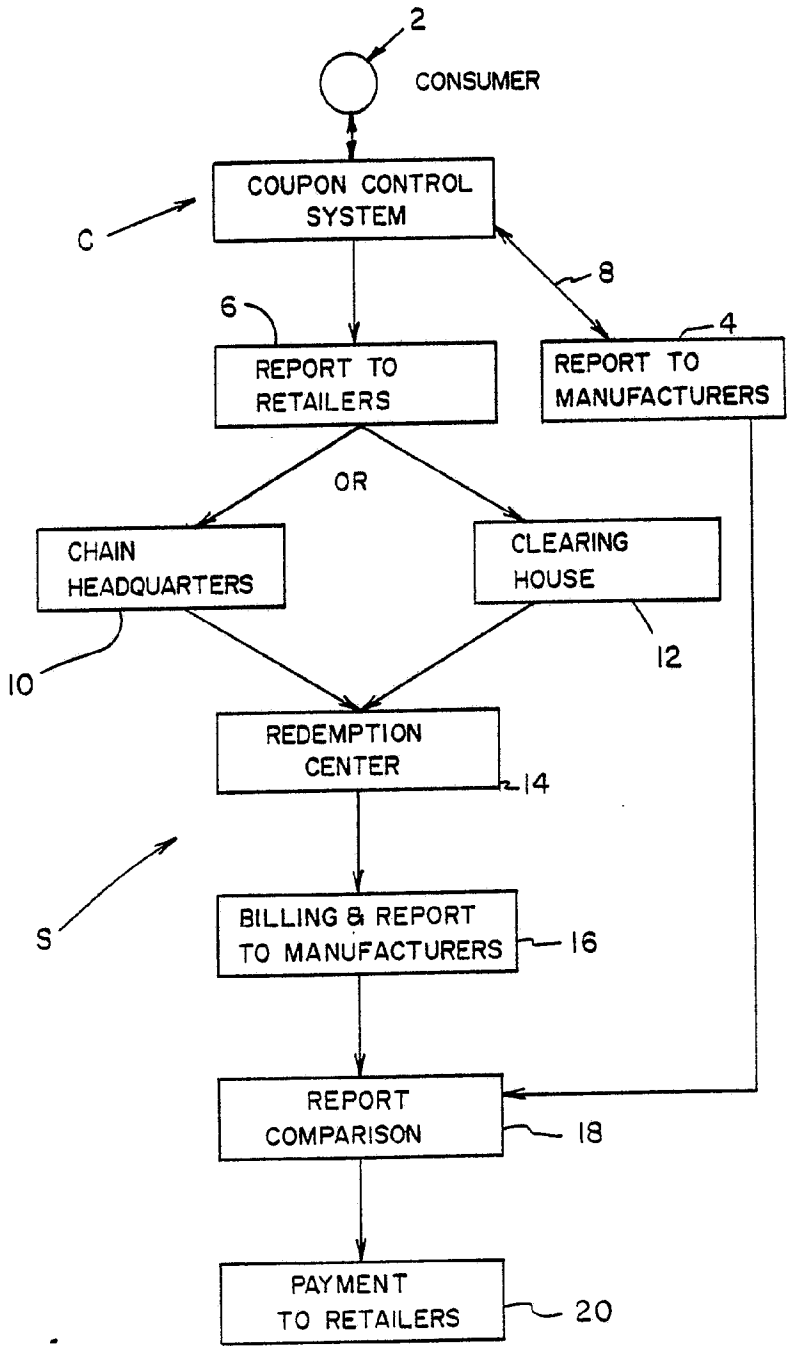


FIG. 1

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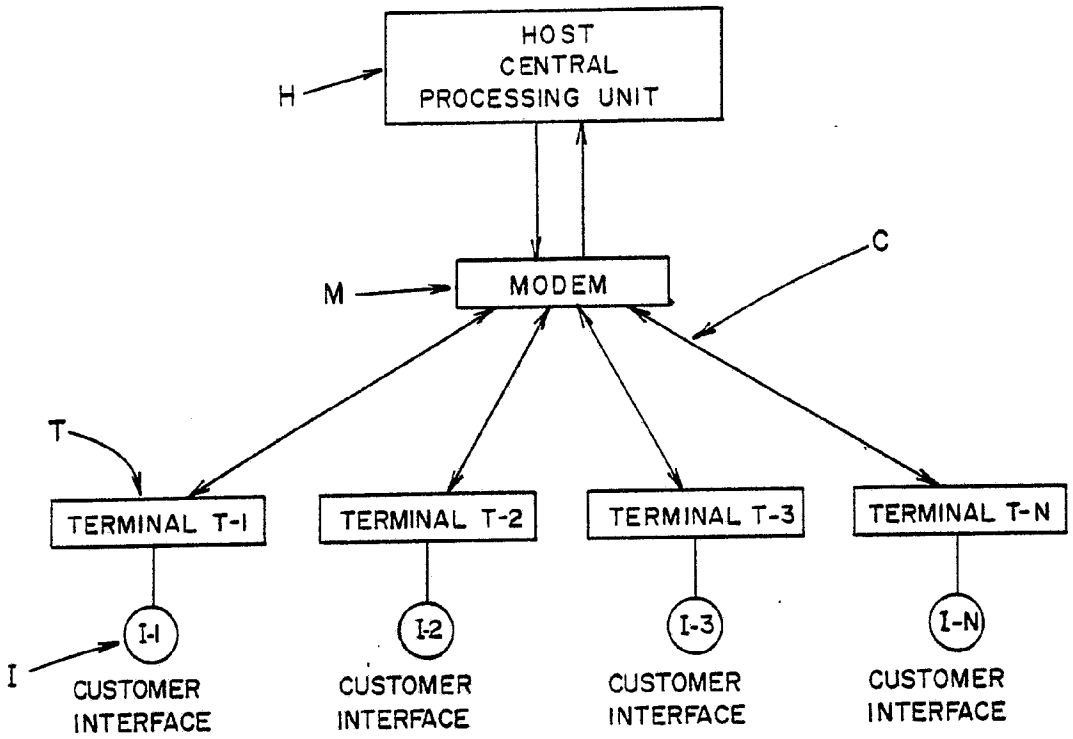


FIG. 2

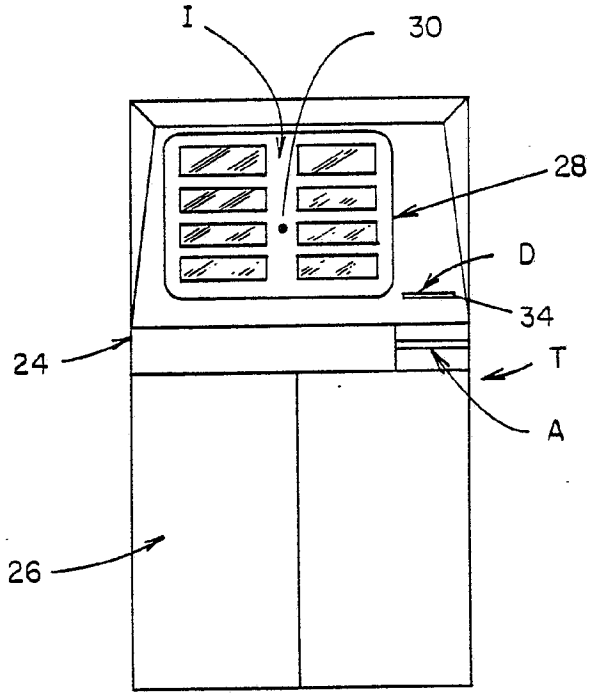


FIG. 3

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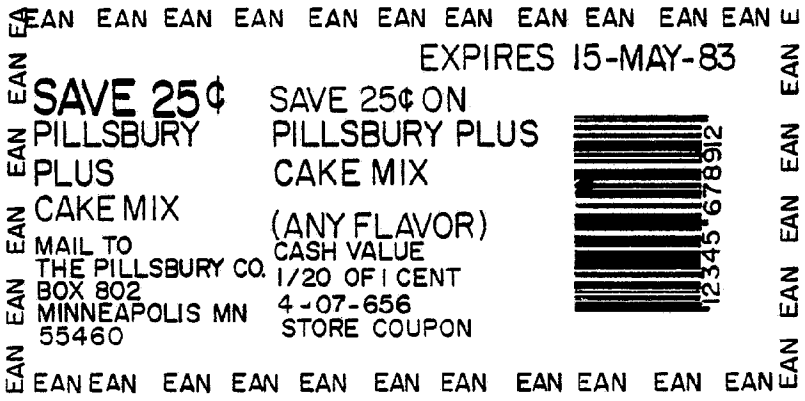


FIG. 3b

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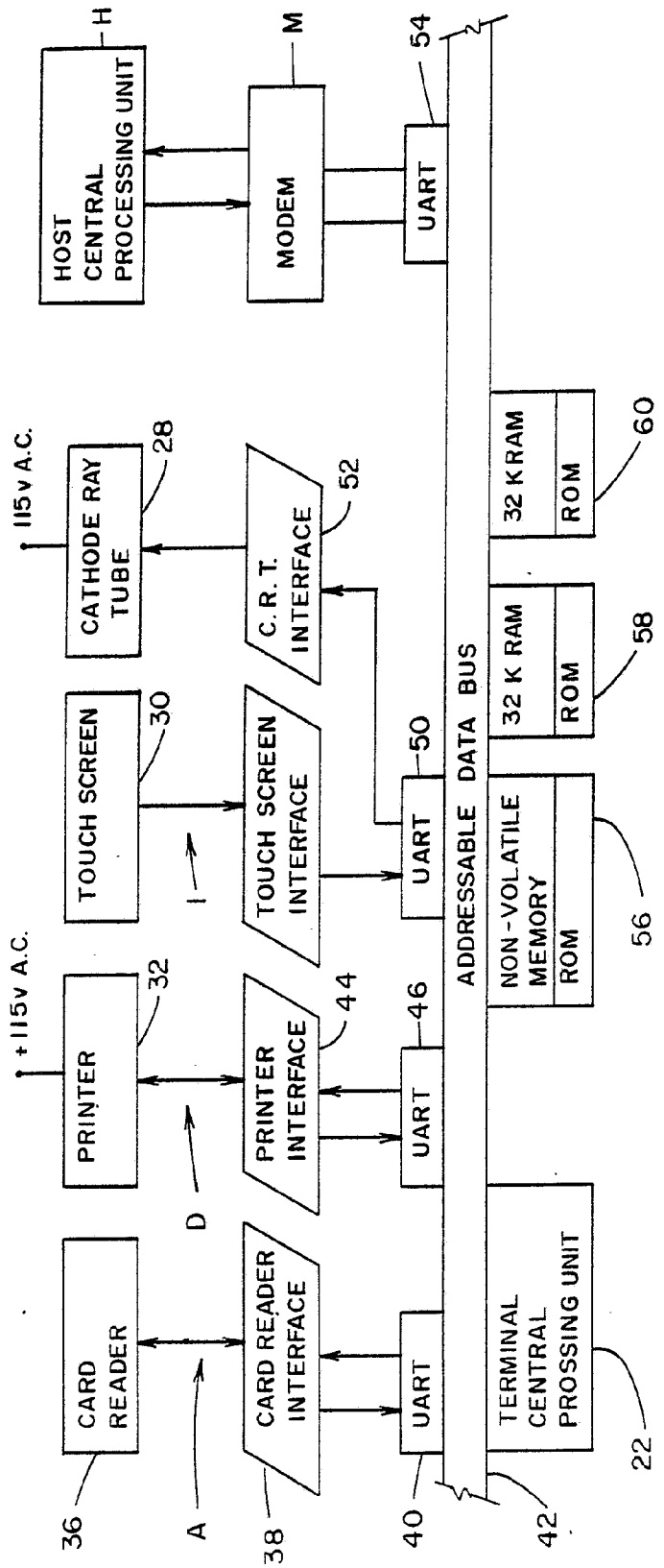


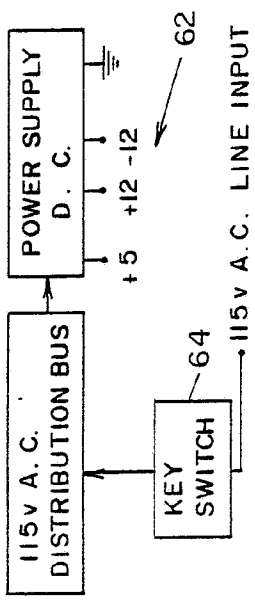


FIG. 4

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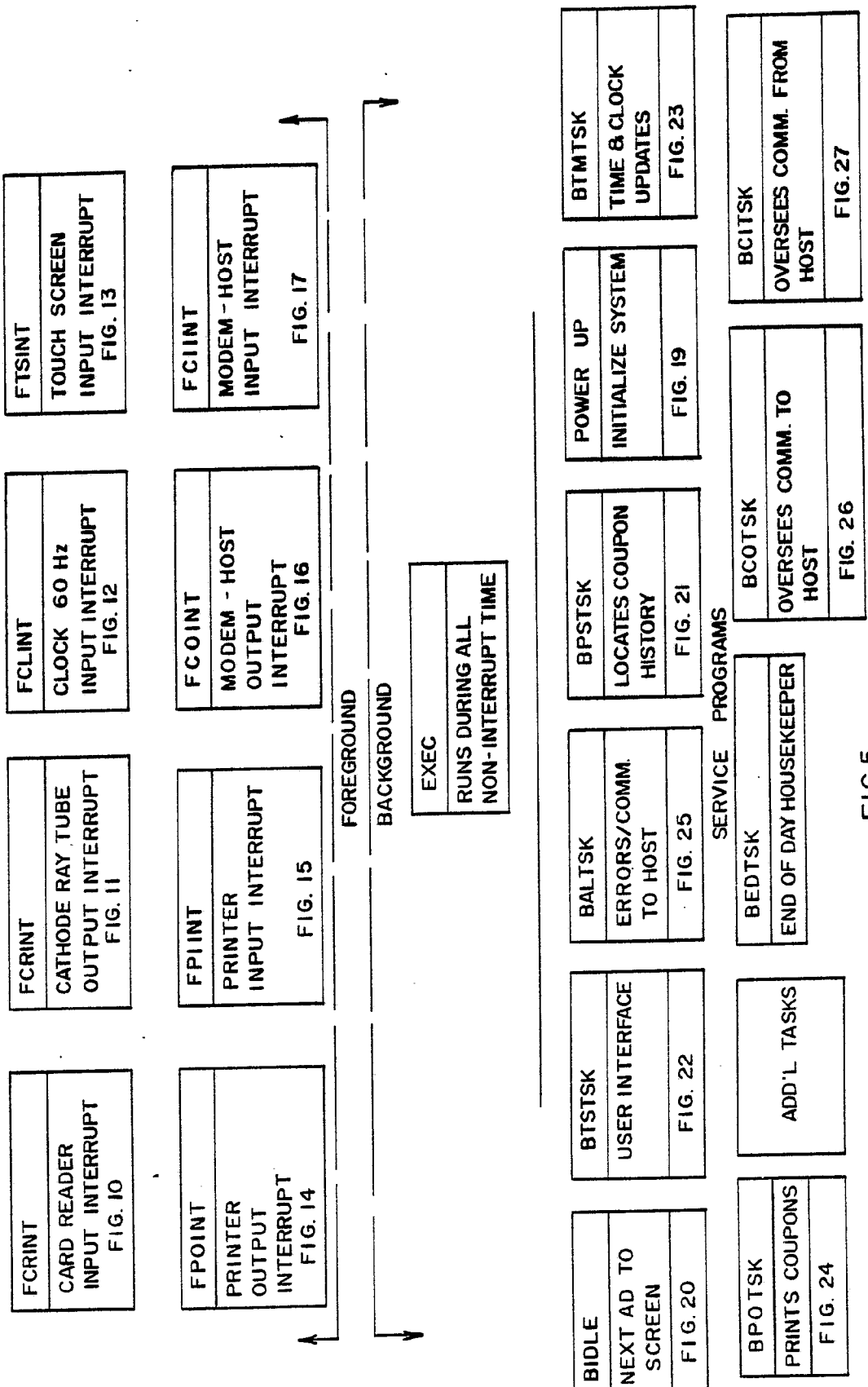


FIG.5

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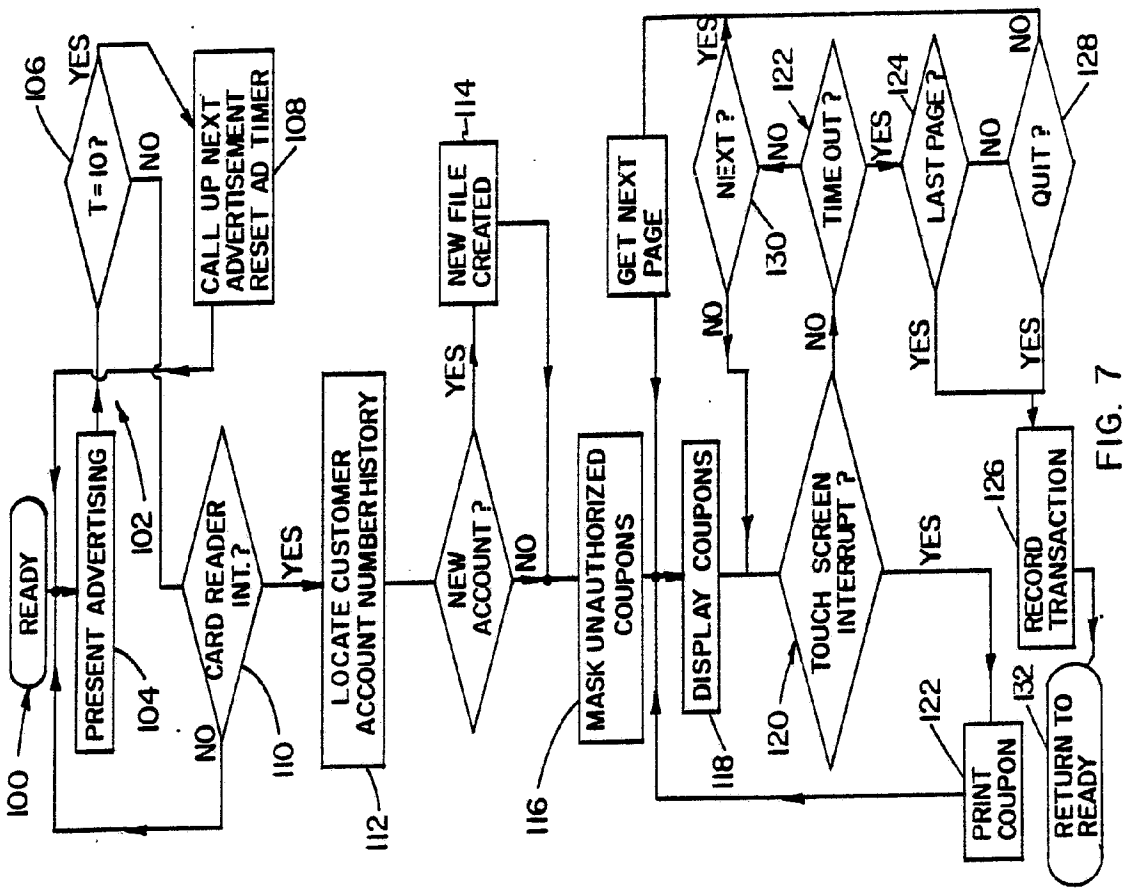


FIG. 7

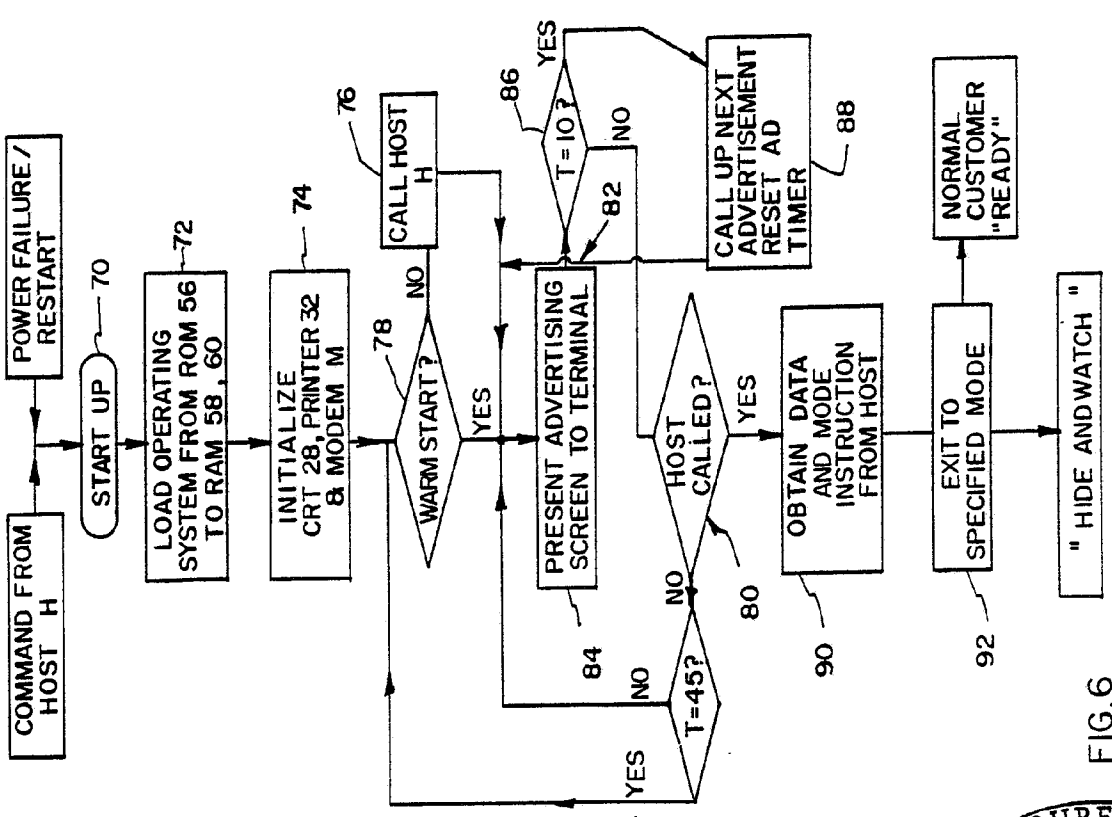


FIG.6

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BUREAU OMPI WIPO INTERNATIONAL

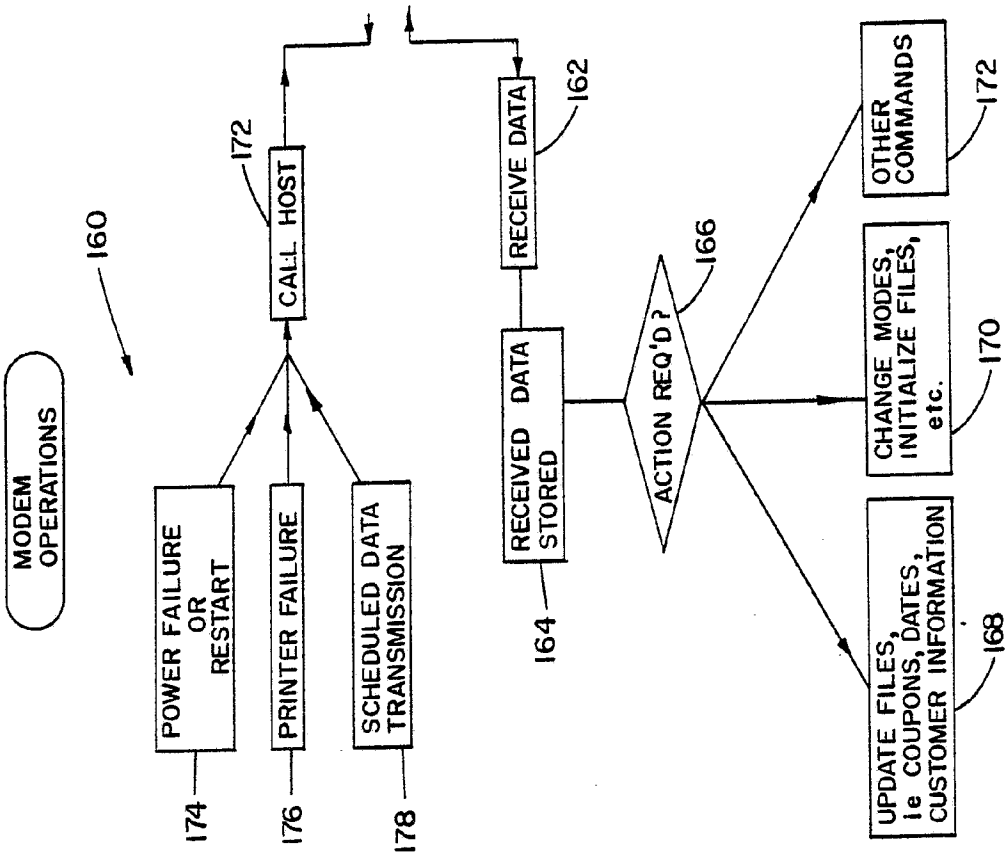


FIG. 9

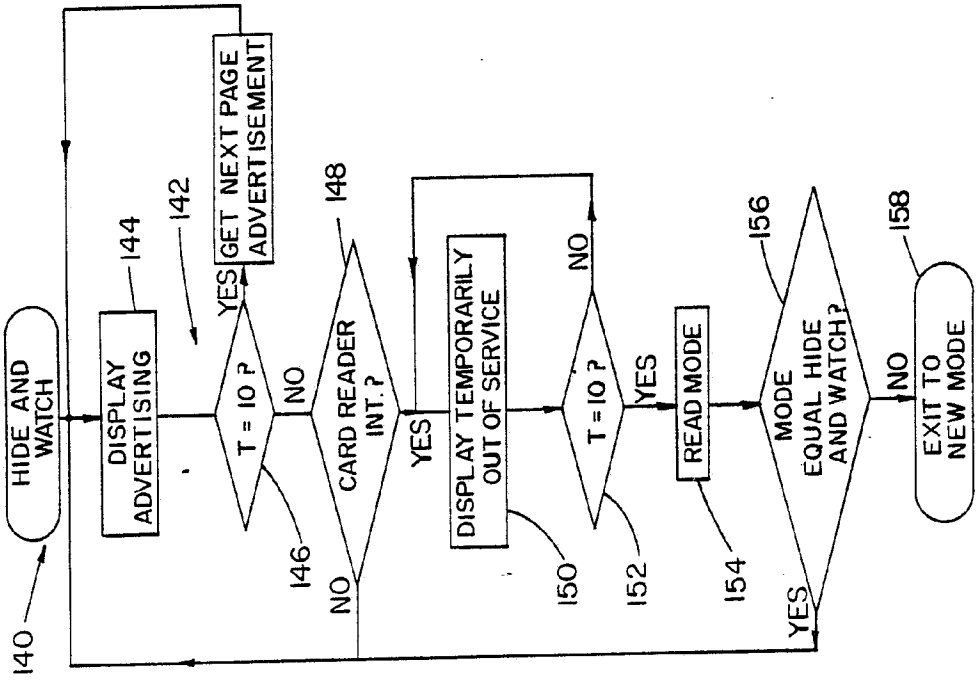


FIG. 8

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BUREAU OMPI WIPO INTERNATIONAL

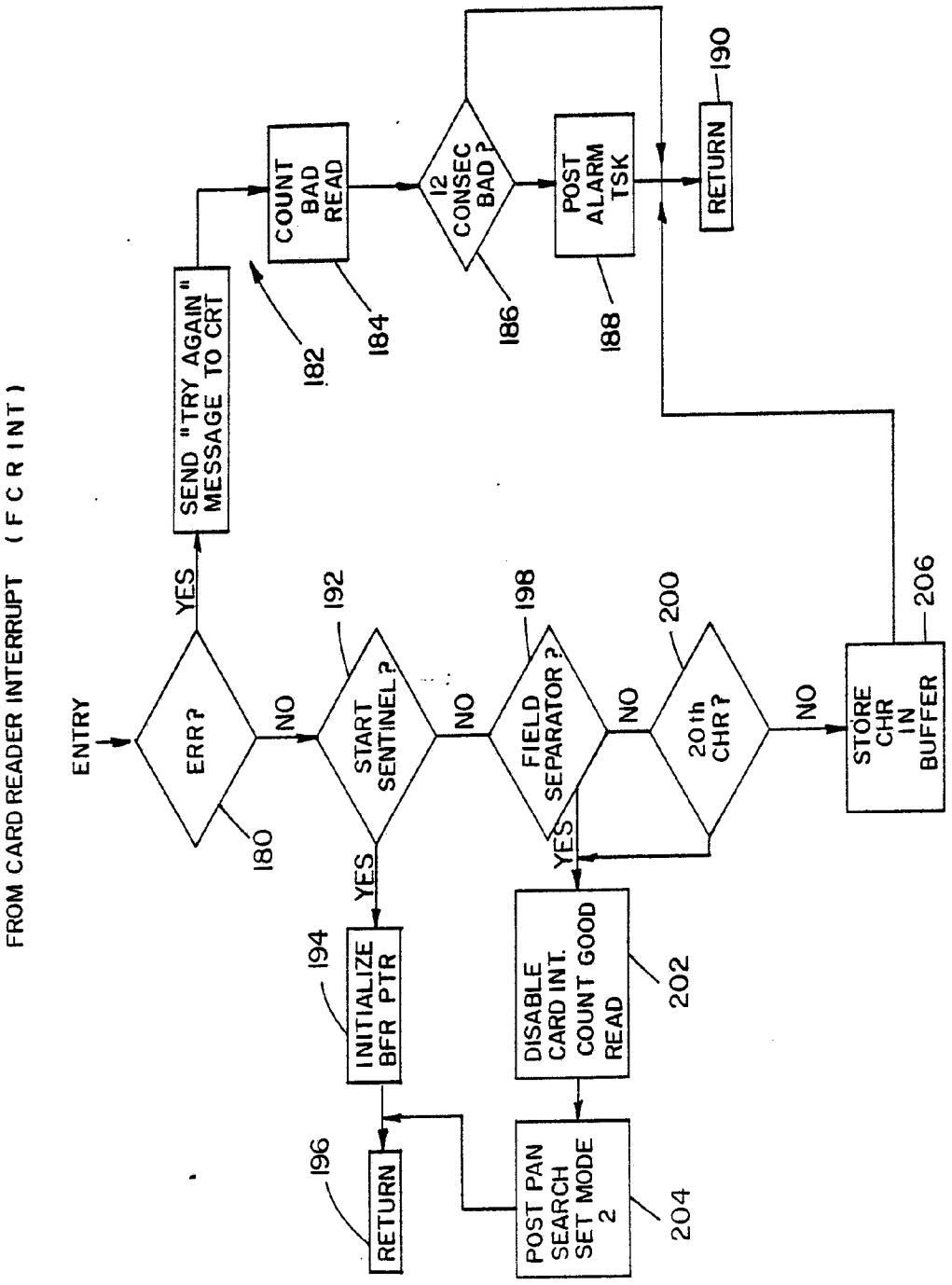


FIG. 10



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INTERRUPT FROM OUTPUT TO CRT (FCSINT)

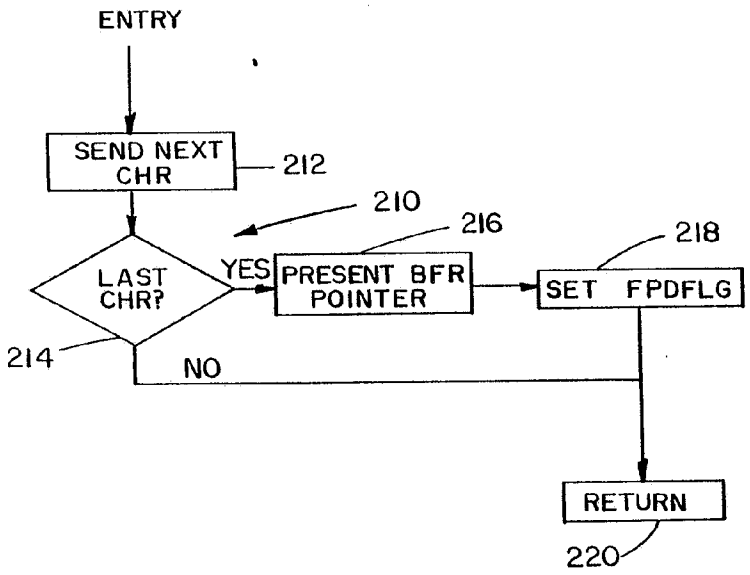


FIG. 11

INTERRUPT FROM CLOCK (FCLINT)

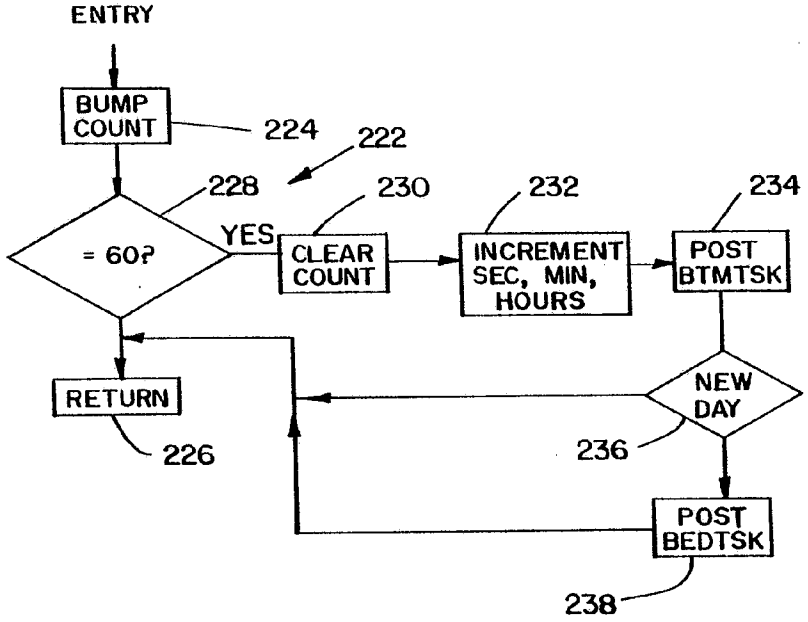


FIG. 12

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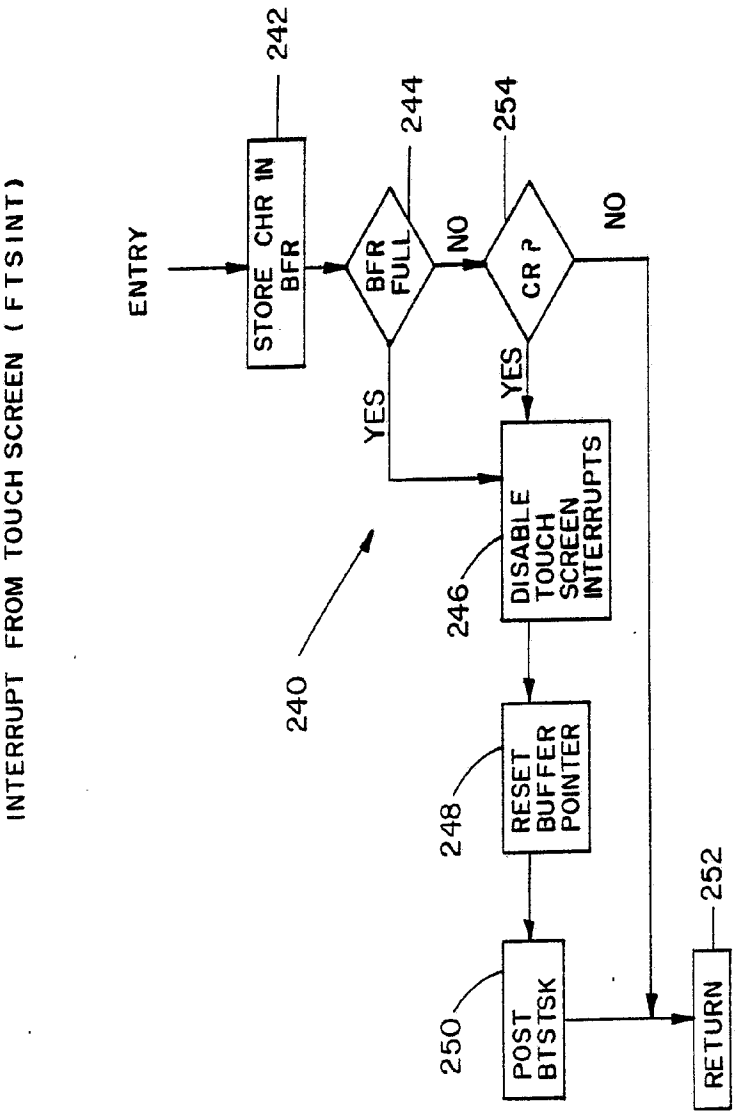


FIG. 13



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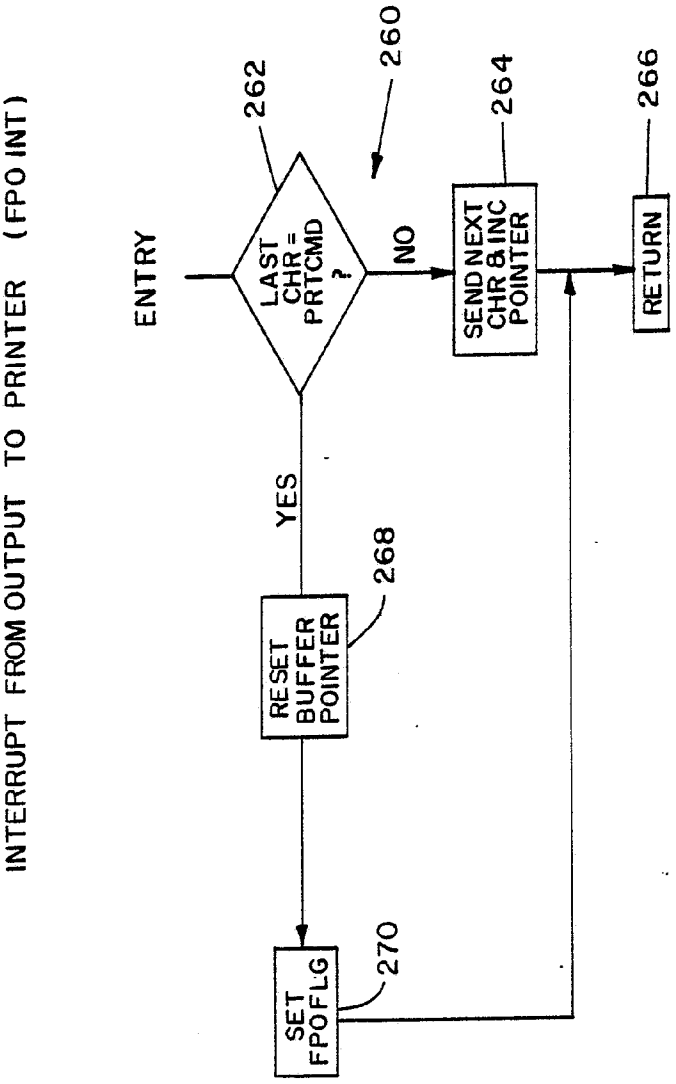


FIG. 14

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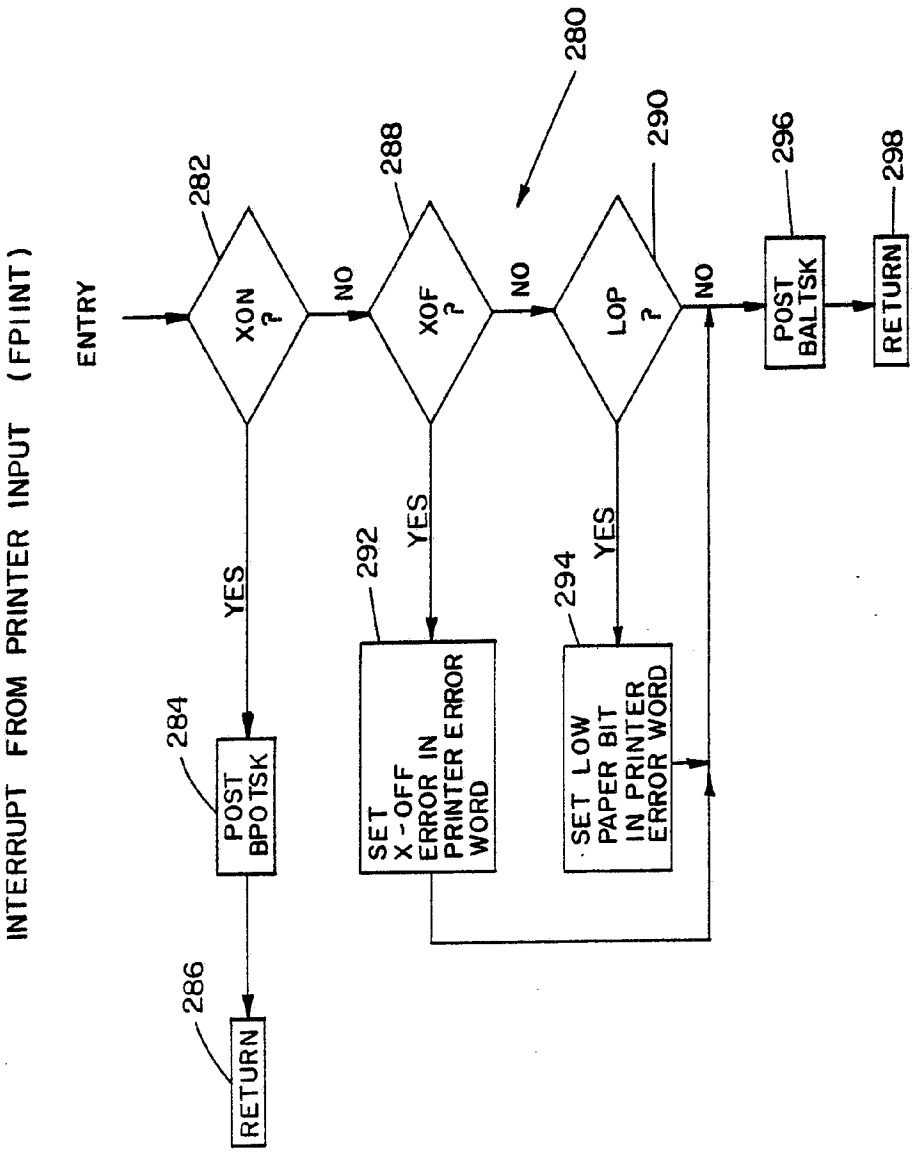


FIG. 15

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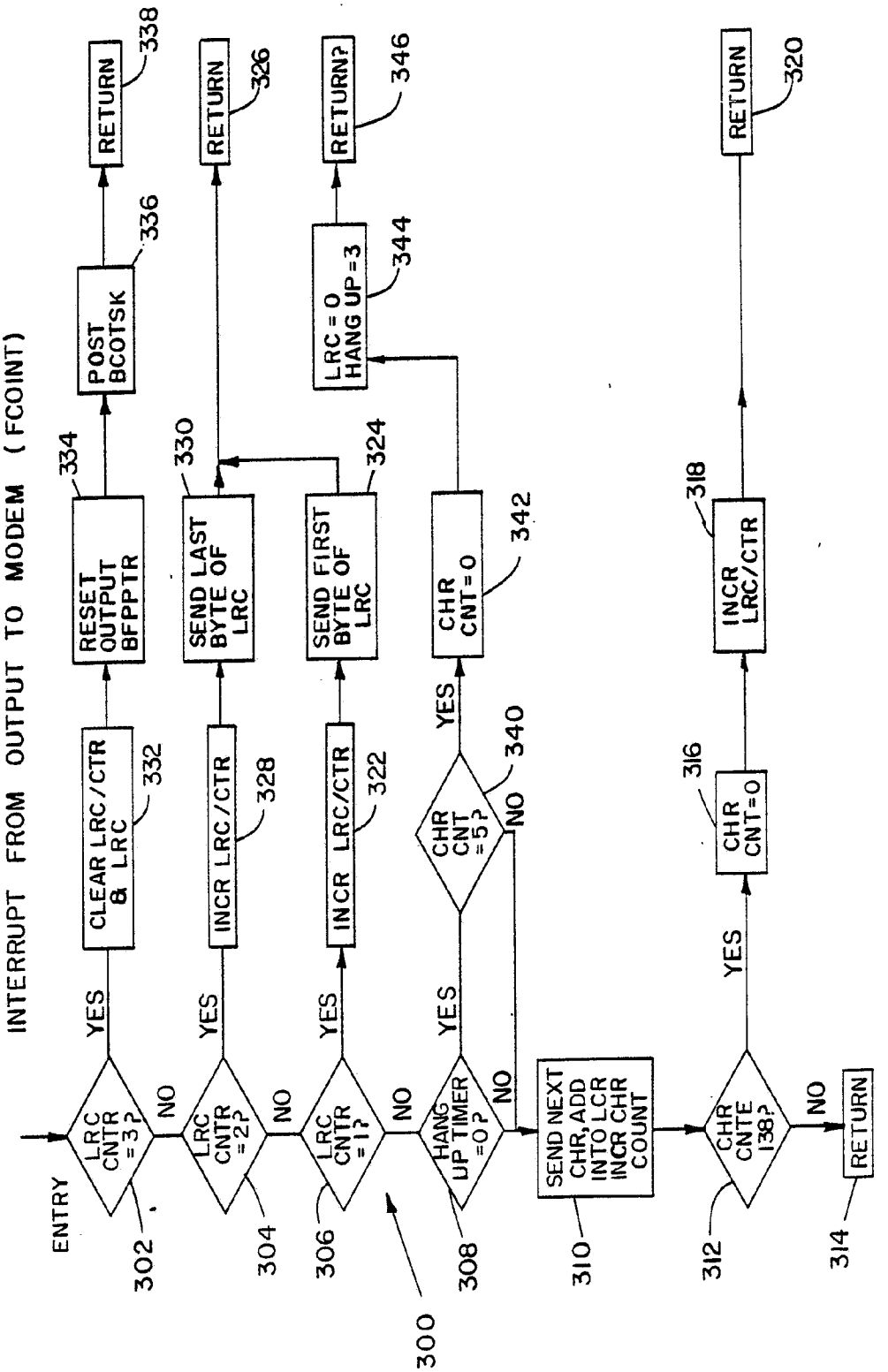


FIG. 16

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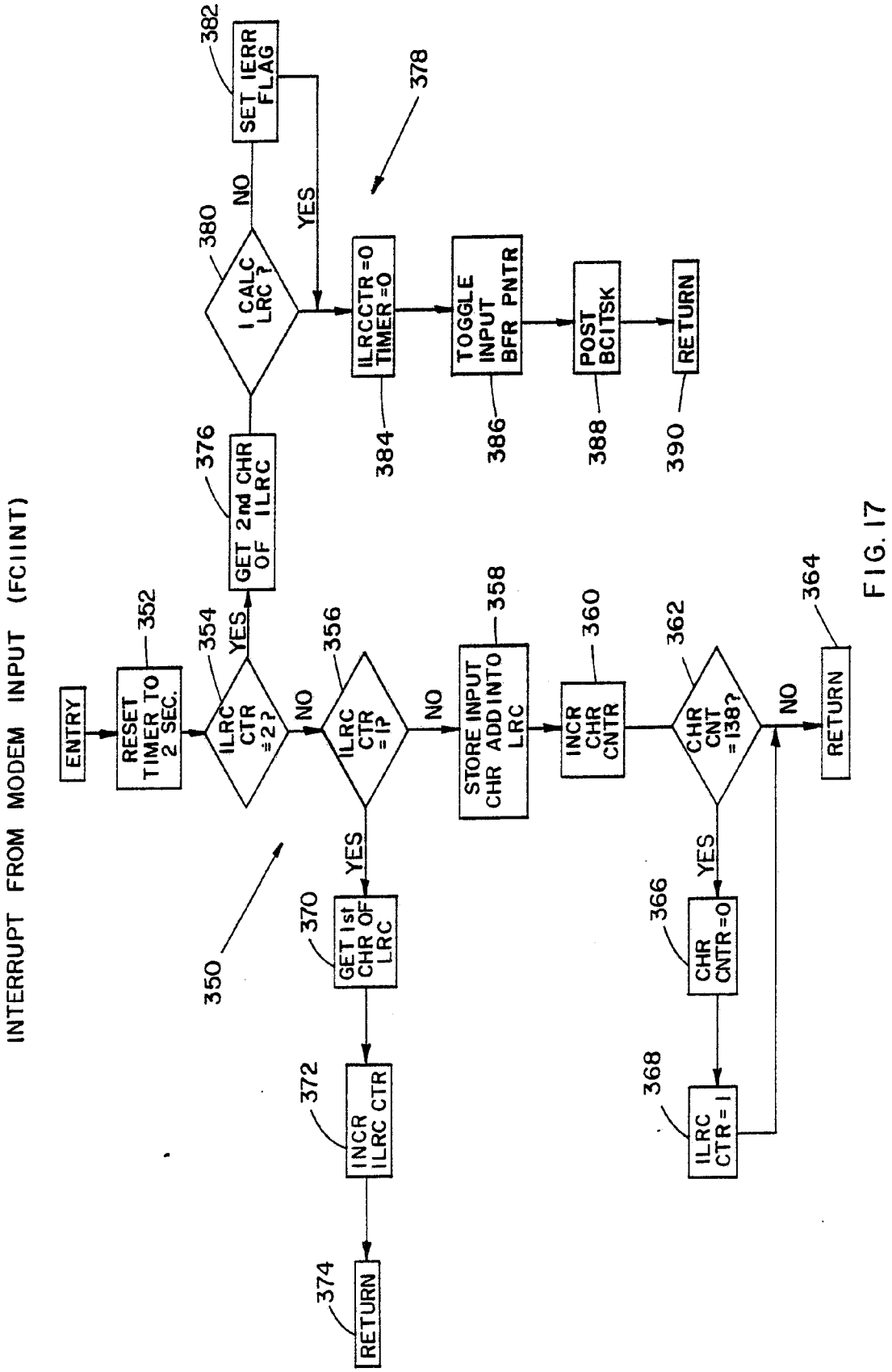


FIG. 17

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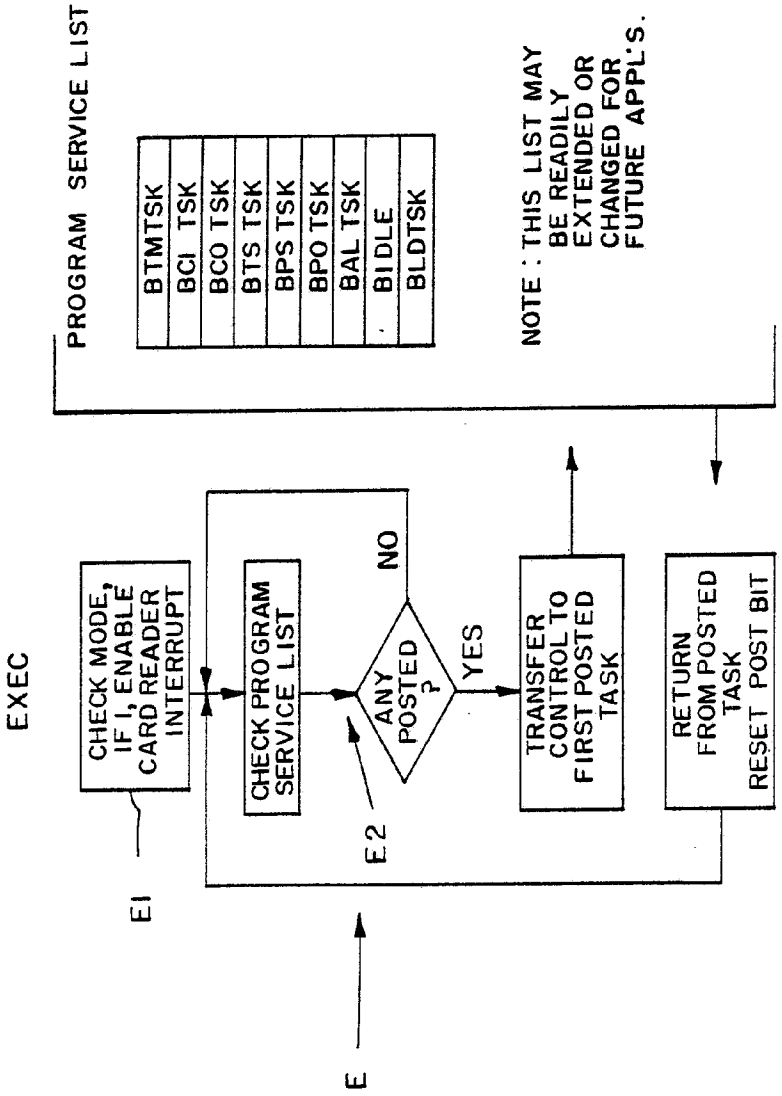


FIG. 18



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COMPUTER POWER UP & OPERATING SYSTEM (HARDWARE/SOFTWARE)

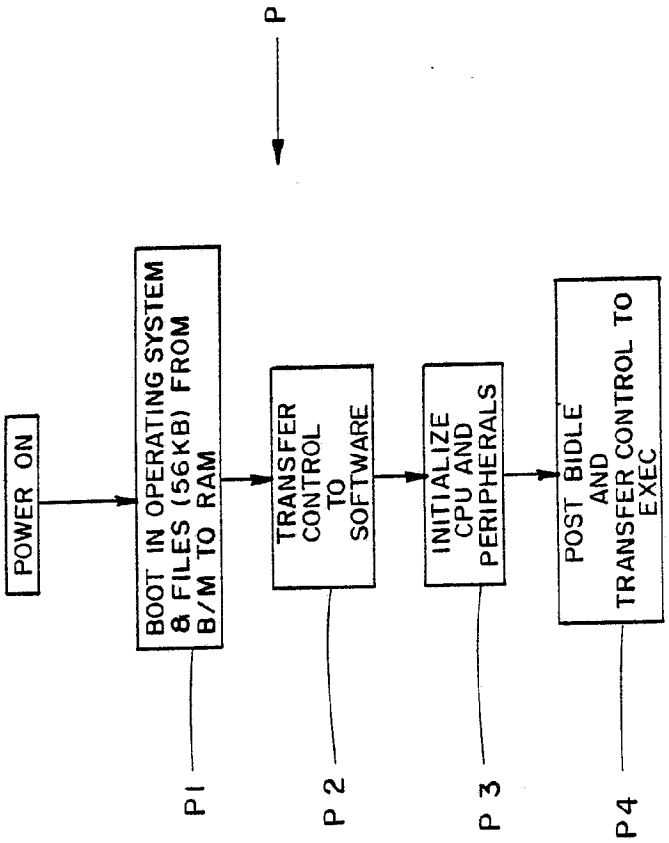


FIG. 19



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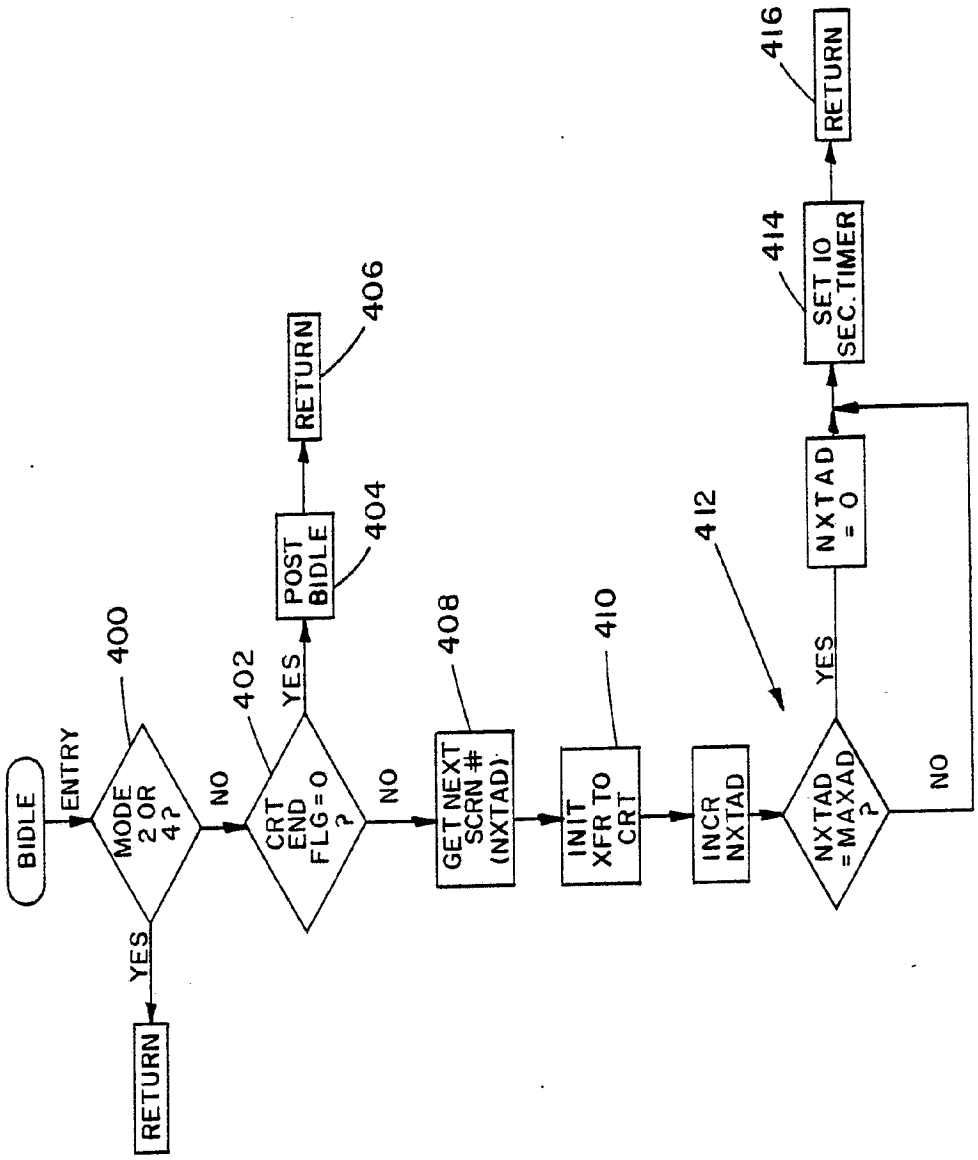


FIG. 20

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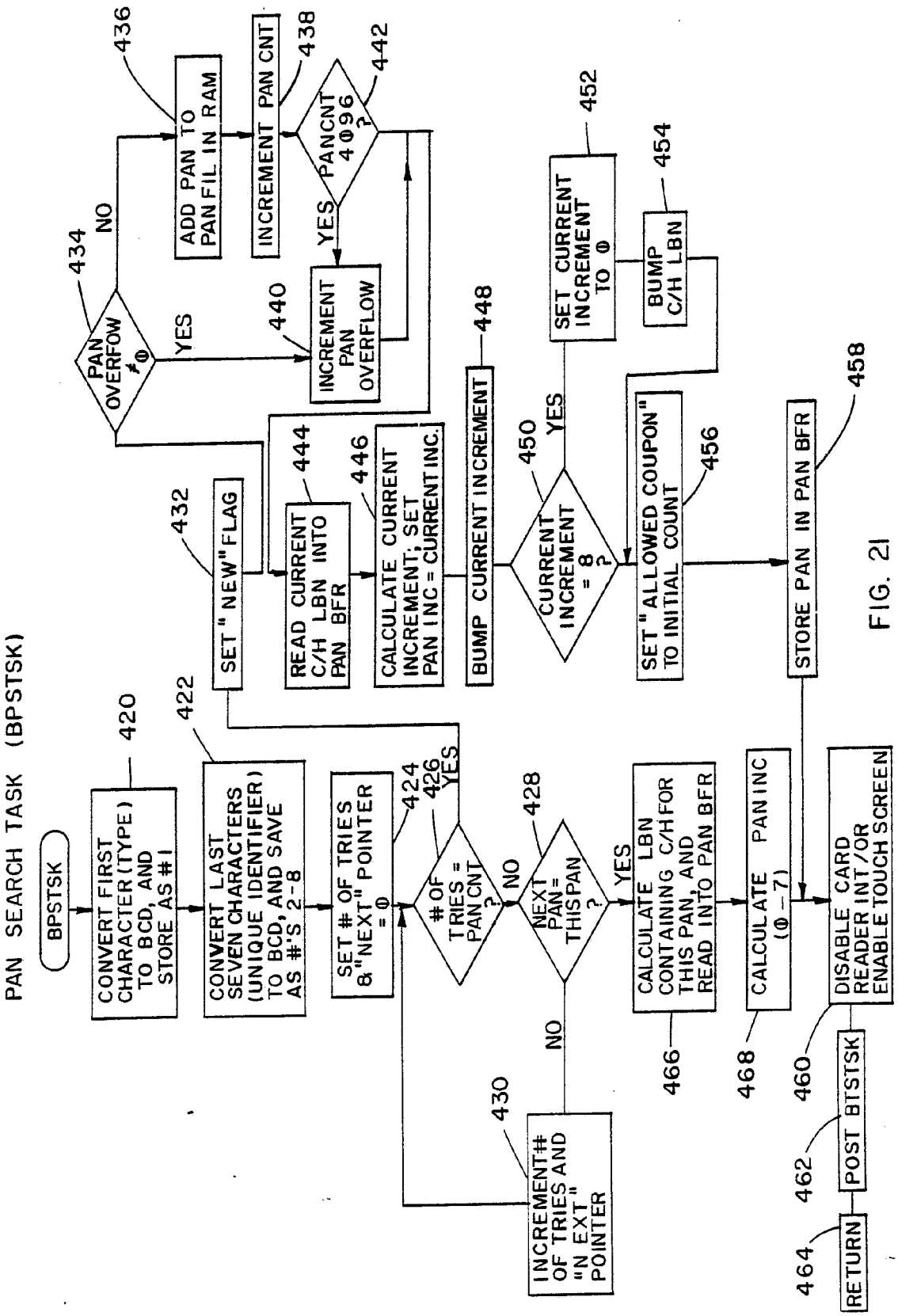


FIG. 21

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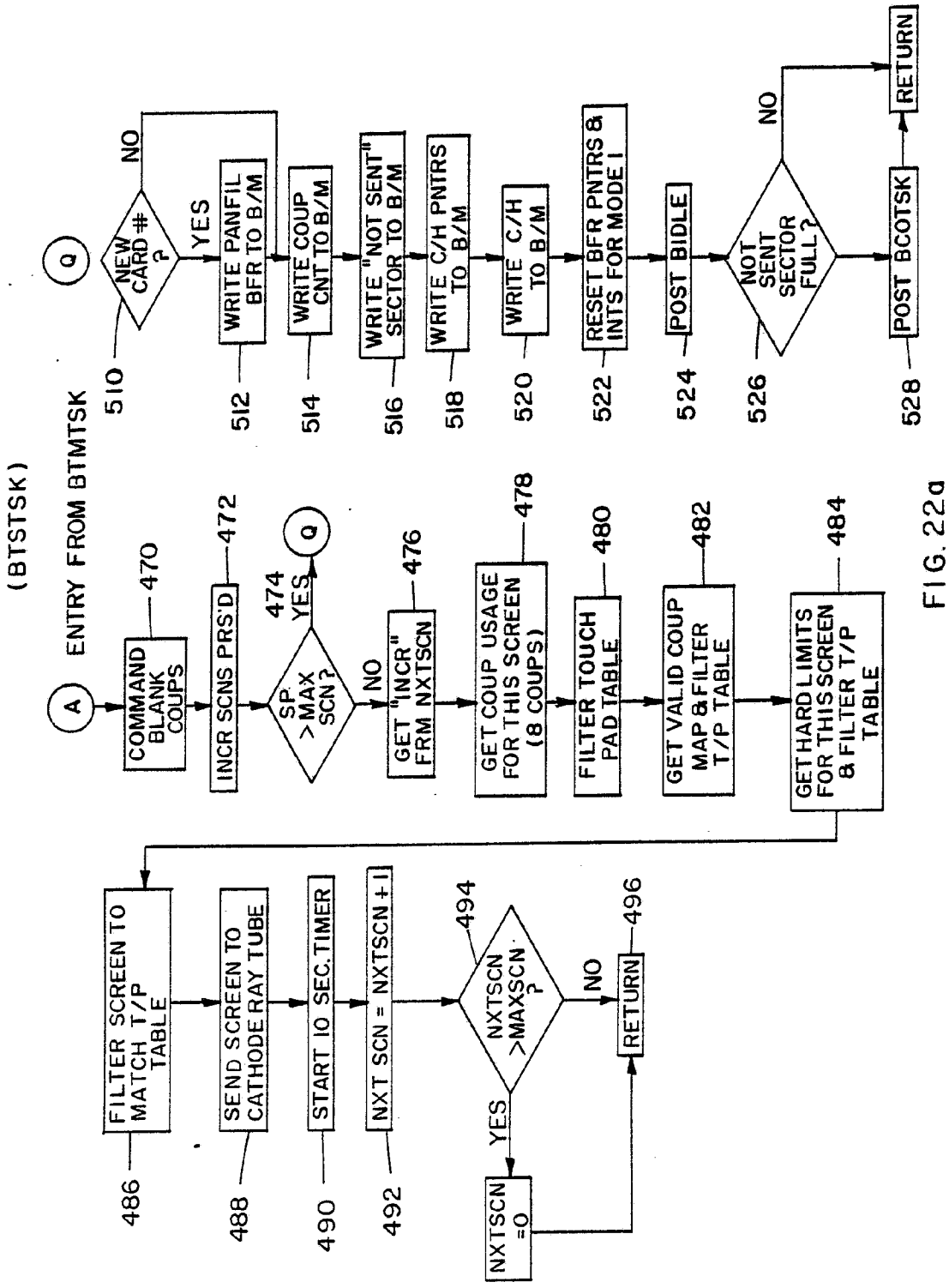


FIG. 22a



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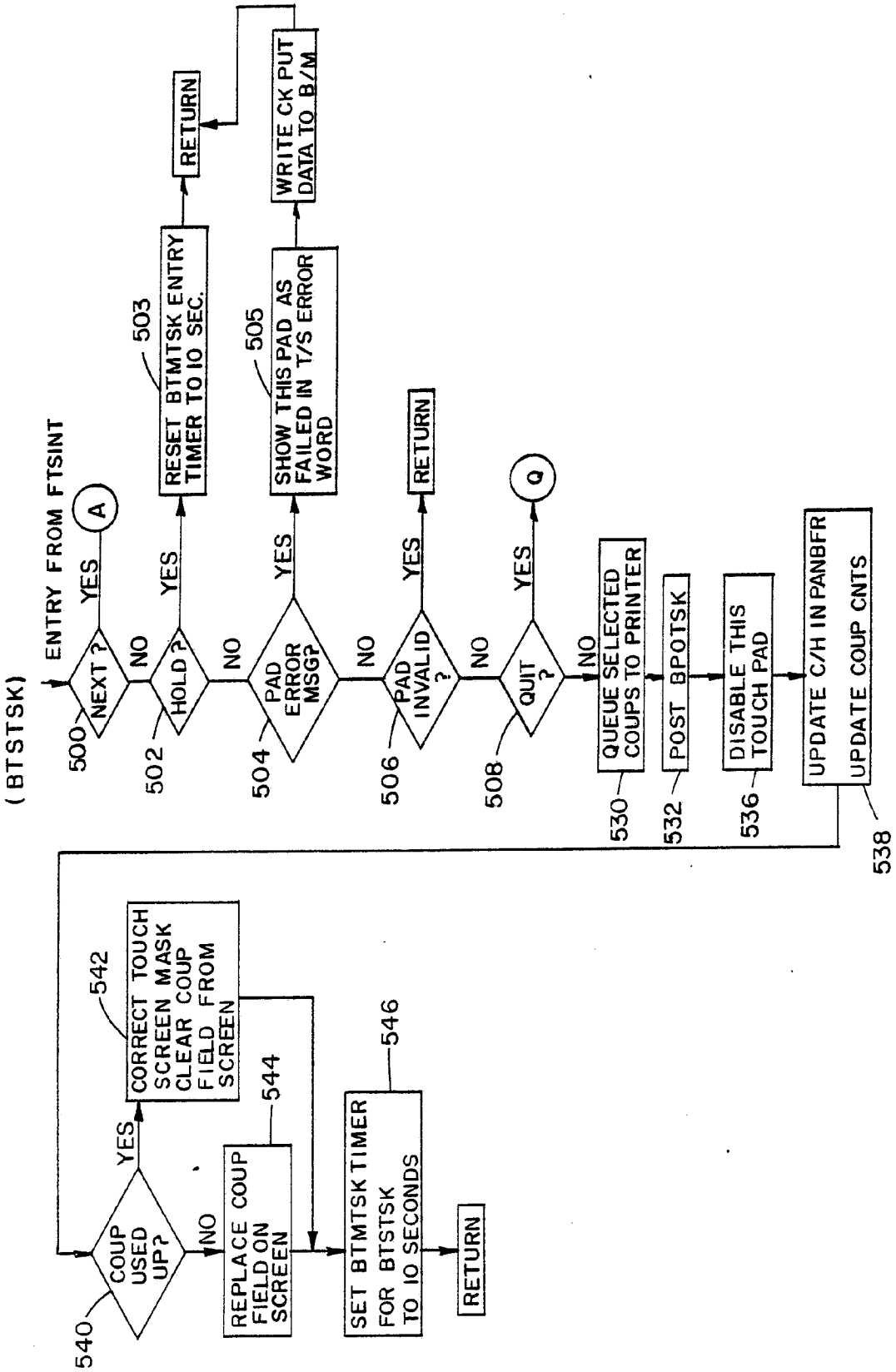


FIG. 22b



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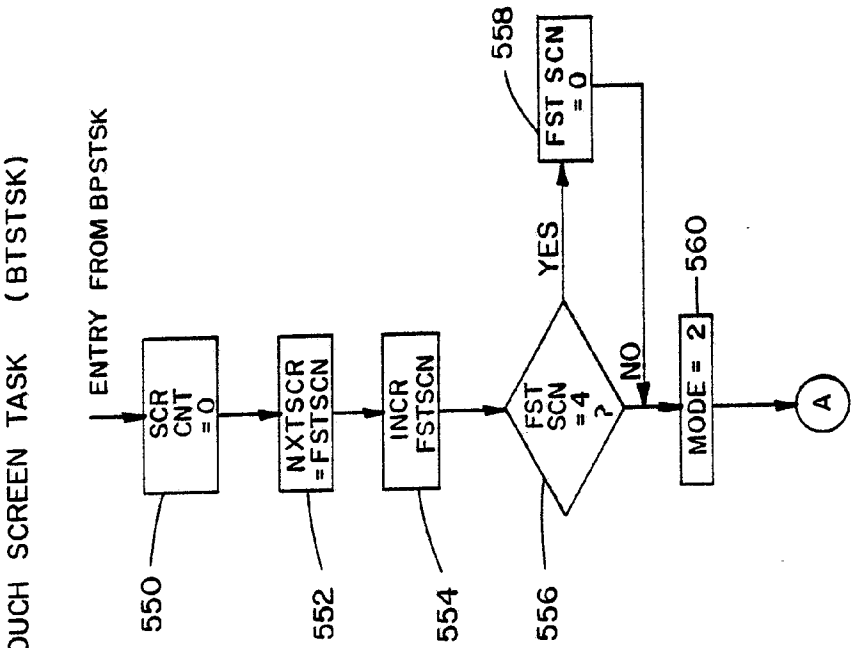


FIG. 22c

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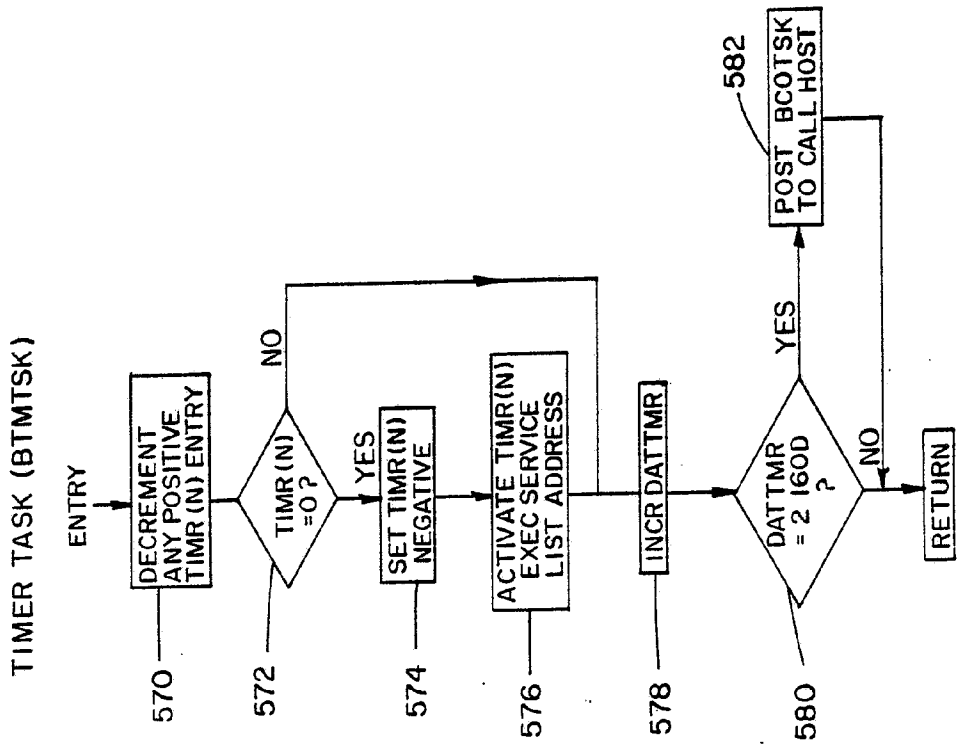


FIG. 23



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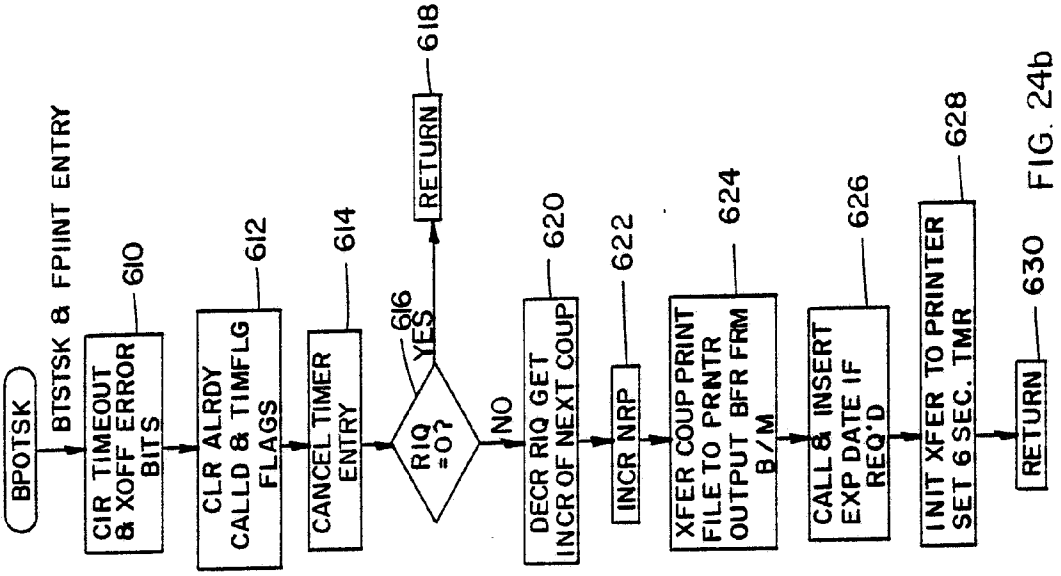


FIG. 24b

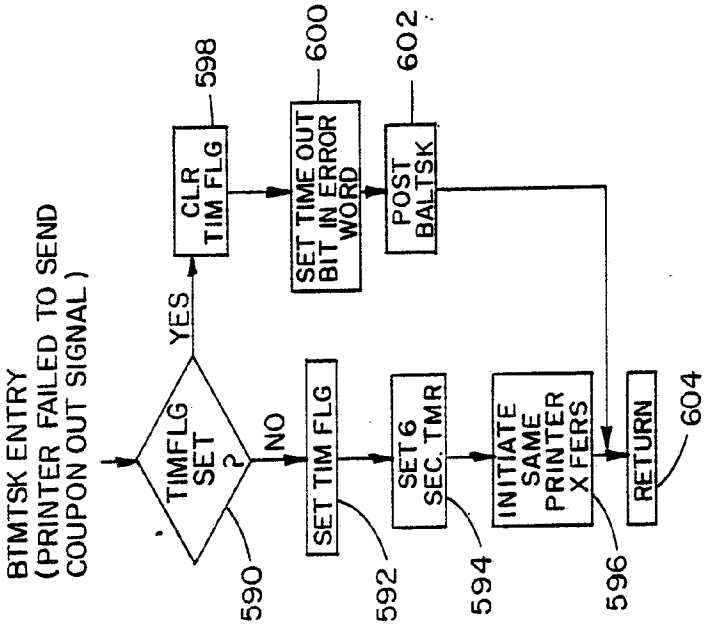


FIG. 24a



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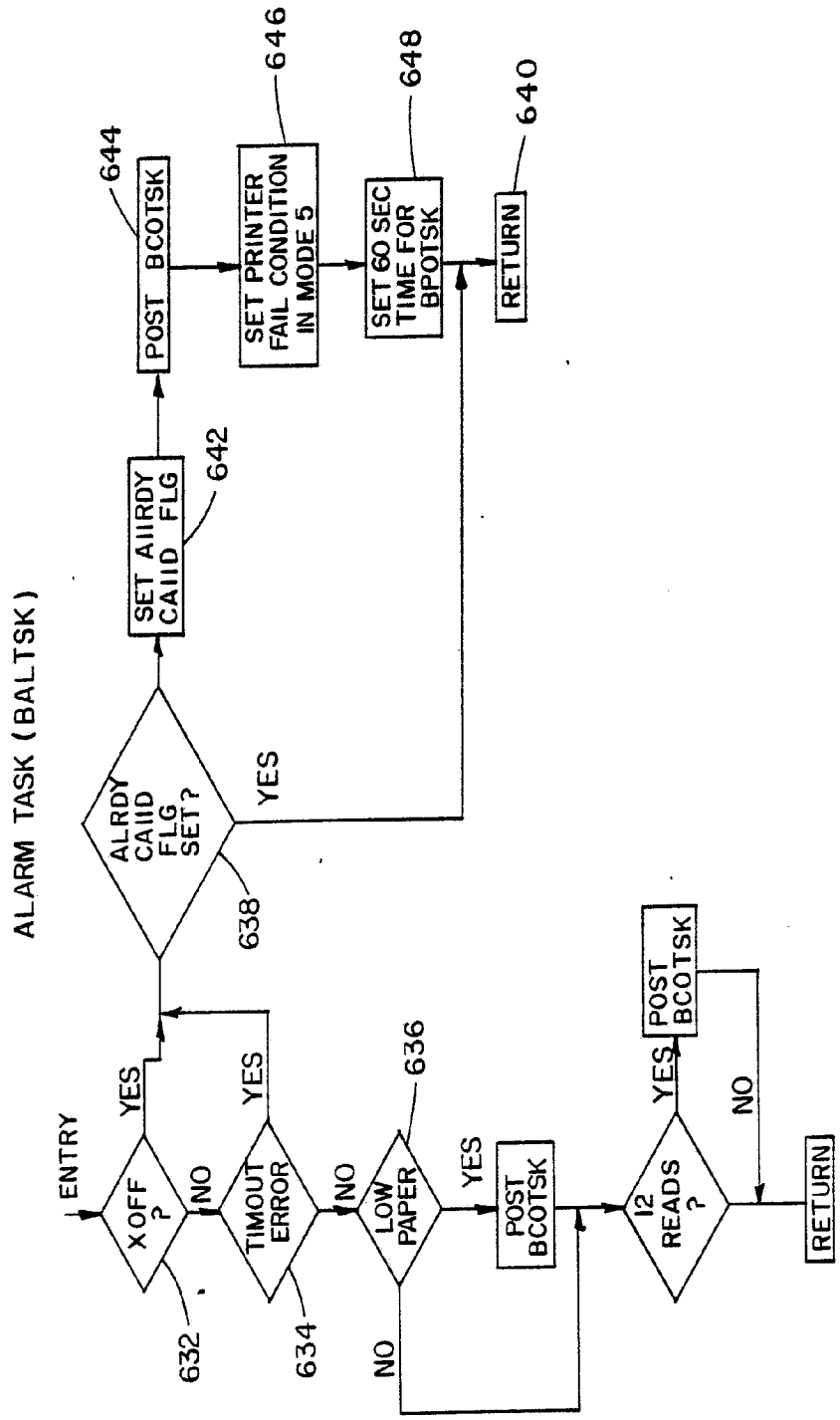


FIG. 25



BUREAU OMPI WIPO INTERNATIONAL

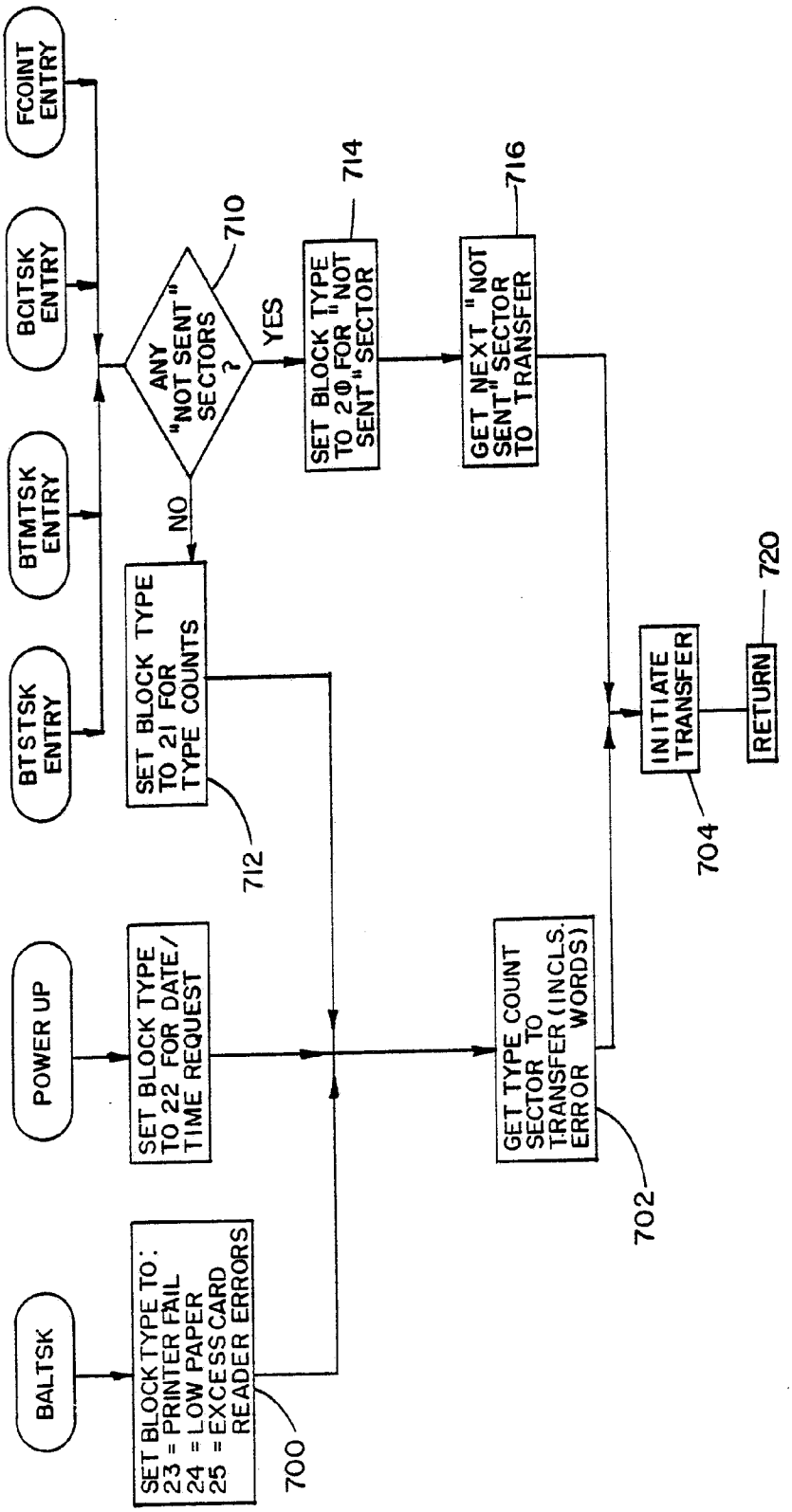


FIG. 26

SUBSTITUTE SHEET

BUREAU OMPI WIPO INTERNATIONAL

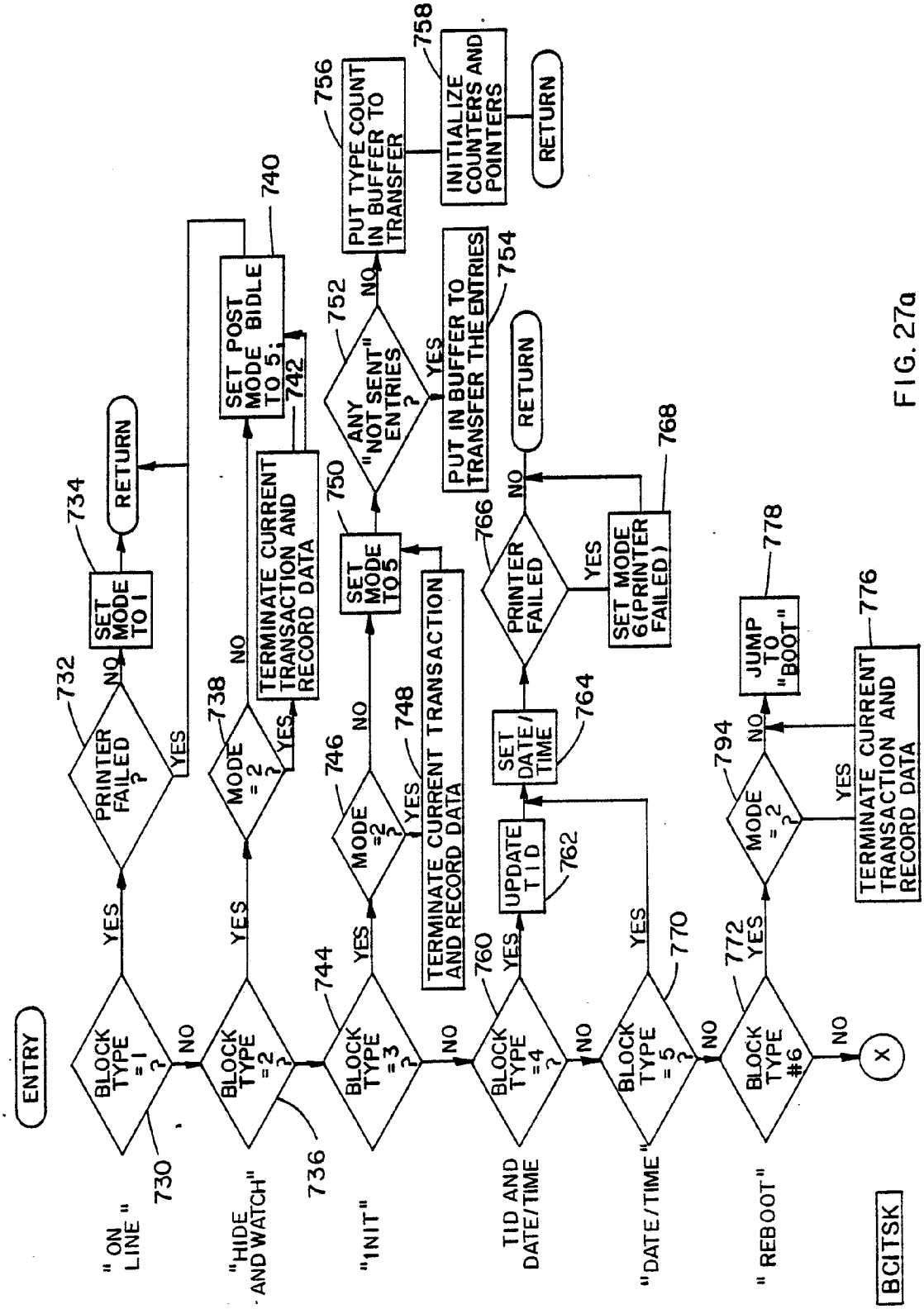


FIG. 27a

SUBSTITUTE SHEET

BUREAU OMPI WIPO INTERNATIONAL

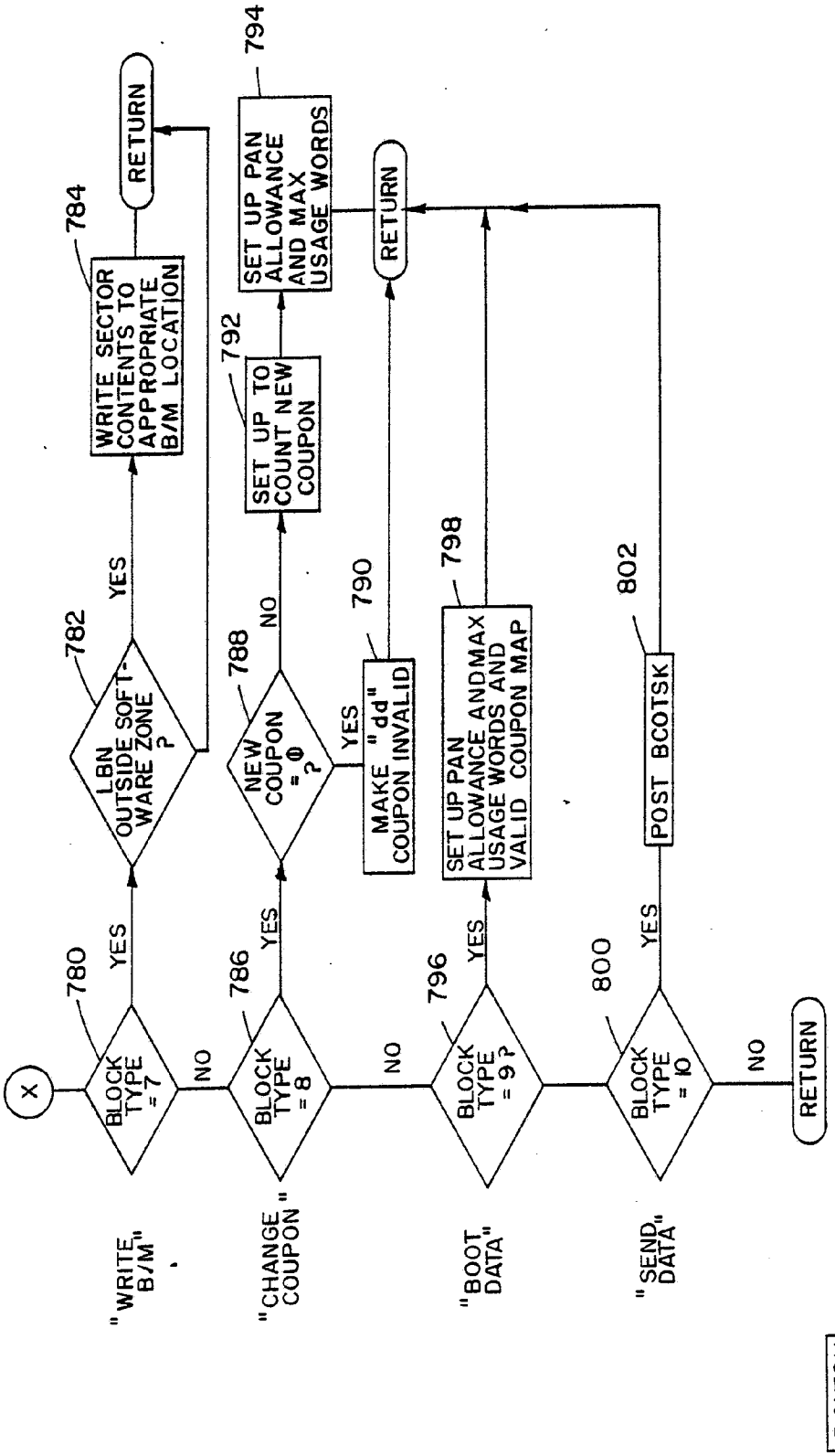


FIG. 27b



BUREAU OMPI WIPO INTERNATIONAL

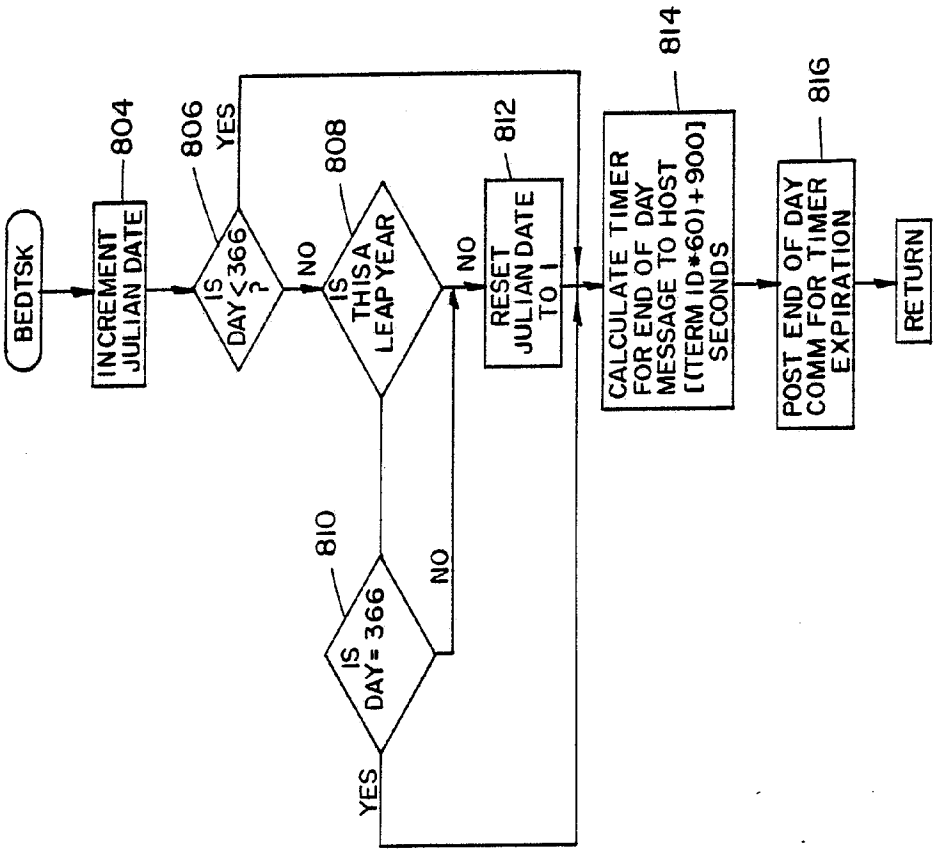


FIG. 28



BUREAU OMPI WIPO INTERNATIONAL

# INTERNATIONAL SEARCH REPORT

International Application No PCT/US 84/01450

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4] : G 07 B 1/02; G 07 F 7/00; G 06 F 15/24

## II. FIELDS SEARCHED

Minimum Documentation Searched [4]

| Classification System | Classification Symbols |
|---|---|
| IPC[4] | G 07 B; G 07 F; G 06 F |

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [5]

## III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

| Category * | Citation of Document, [16] with indication, where appropriate, of the relevant passages [17] | Relevant to Claim No. [18] |
|---|---|---|
| Y | US, A, 4124109 (R. BISSELL) 7 November 1978 see abstract; figures; column 1, line 63 - column 4, line 10; column 5, line 66 - column 6, line 30 | 1,2 |
| A | -- | 12,14,26 |
| Y | US, A, 4247759 (Y. NORA) 27 January 1981 see abstract; figures; column 1, lines 35-54; column 2, line 7 - column 5, line 36 | 1,2 |
| A | -- | 14,15,26 |
| A | US, A, 4186438 (P.H. BENSON) 29 January 1980 see abstract; figure 1; claims | 1,3,4,6-10, 15-17,19-23 26,27 |
| | -- | |
| P,A | US, A, 4449186 (G.M. KELLY) 15 May 1984 see abstract; figures; column 1, line 60 - column 2, line 52 | 1-10,13-17, 19,23,26,31 32 |
| | -- | |

* Special categories of cited documents: [15]

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

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

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

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

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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

| Date of the Actual Completion of the International Search [2] | Date of Mailing of this International Search Report [2] |
|---|---|
| 19th December 1984 | 28 JAN. 1985 |
| **International Searching Authority [1]** | **Signature of Authorized Officer [20]** |
| EUROPEAN PATENT OFFICE | G.L.M. Kruydenberg |

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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

| Category * | Citation of Document, 16 with indication, where appropriate, of the relevant passages 17 | Relevant to Claim No 18 |
|---|---|---|
| A | GB, A, 2109305 (P.J. WELLS) 2 June 1983 -- | |
| A | US, A, 3890599 (L.G. SIMJIAN) 17 June 1975 -- | |
| A | US, A, 4071697 (N.K. BUSHNELL) 31 January 1978 -- | |
| A | US, A, 4231014 (V. PONZIO) 28 October 1980 -- | |
| A | US, A, 4359631 (L.B. LOCKWOOD) 16 November 1982 | |

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Publication Number: WO 01/58098 A2
Publication Date: Aug 09, 2001

## Abstract

Apparatus and method to determine the position of a wireless device with Bluetooth capabilities. The method relies on transferring positioning information between devices using Bluetooth technology. If one of these devices knows its position (because it is in fixed position or because it has a GPS receiver or GPS sensor, or other ways of determining its own position), then this positioning information can be transferred to other devices in the RF proximity. In addition, triangulation using range measurements, and/or signal strength from several devices in the RF proximity can be used to determine the device position.

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9 August 2001 (09.08.2001)

PCT

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(51) International Patent Classification[7]: H04L 12/56

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(30) Priority Data:
09/500,189 7 February 2000 (07.02.2000) US

(71) Applicant: QUALCOMM INCORPORATED [US/US]; 5775 Morehouse Drive, San Diego, CA 92121-1714 (US).

(72) Inventor: SOLIMAN, Samir, S.; 11412 Cypress Canyon Park Drive, San Diego, CA 92131 (US).

(74) Agents: WADSWORTH, Philip, R. et al.; Qualcomm Incorporated, 5775 Morehouse Drive, San Diego, CA 92121-1714 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**
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7 March 2002

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WO 01/58098 A3

(54) Title: POSITION DETERMINATION USING BLUETOOTH DEVICES

(57) Abstract: Apparatus and method to determine the position of a wireless device with Bluetooth capabilities. The method relies on transferring positioning information between devices using Bluetooth technology. If one of these devices knows its position (because it is in fixed position or because it has a GPS receiver or GPS sensor, or other ways of determining its own position), then this positioning information can be transferred to other devices in the RF proximity. In addition, triangulation using range measurements, and/or signal strength from several devices in the RF proximity can be used to determine the device position.

# INTERNATIONAL SEARCH REPORT

Inter onal Application No
PCT/US 01/03982

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L G01S

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

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

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | BENNETT F ET AL: "PICONET: EMBEDDED MOBILE NETWORKING" IEEE PERSONAL COMMUNICATIONS, IEEE COMMUNICATIONS SOCIETY, US, vol. 4, no. 5, 1 October 1997 (1997-10-01), pages 8-15, XP000721301 ISSN: 1070-9916 | 1,6,7,12 |
| A | page 11, column 1, line 18 - line 50<br>page 11, column 2, line 29 - line 35<br>page 12, column 1, line 33 -column 2, line 3<br>page 13, column 1, line 9 - line 22<br>page 14, column 1, line 28 - line 31<br>page 14, column 2, line 1 - line 9<br>page 15, column 1, line 6 - line 21 | 2,5,11, 16 |

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

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

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

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 29 October 2001 | 05/11/2001 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | M. García |

3

Form PCT/ISA/210 (second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/US 01/03982

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication,where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | WO 98 00988 A (ERICSSON GE MOBILE INC)<br>8 January 1998 (1998-01-08)<br>page 16, line 30 -page 17, line 6 | 5,11,16 |
| A | WANT R ET AL: "ACTIVE BADGES AND PERSONAL INTERACTIVE COMPUTING OBJECTS"<br>IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, IEEE INC. NEW YORK, US,<br>vol. 38, no. 1,<br>1 February 1992 (1992-02-01), pages 10-20,<br>XP000297357<br>ISSN: 0098-3063<br>page 18, column 1, line 6 - line 22 | 1,7,12 |
| A | EP 0 748 085 A (GEN ELECTRIC)<br>11 December 1996 (1996-12-11)<br>page 3, line 1 - line 19 | 1,2 |

3

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte: onal Application No
PCT/US 01/03982

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| WO 9800988 A | 08-01-1998 | AU 3592797 A | 21-01-1998 |
| | | WO 9800988 A2 | 08-01-1998 |
| EP 0748085 A | 11-12-1996 | US 5691980 A | 25-11-1997 |
| | | CA 2176869 A1 | 08-12-1996 |
| | | EP 0748085 A1 | 11-12-1996 |
| | | IL 118285 A | 22-12-1999 |
| | | JP 9171571 A | 30-06-1997 |

Form PCT/ISA/210 (patent family annex) (July 1992)

Publication Number: WO 01/73575 A1
Publication Date: Oct 04, 2001

## Abstract

The present invention relates to systems, methods and apparatus for making purchase transactions at a point-of-sale. A wireless purchase device (WPD) (2) comprising a short-range communications device (14) for communication with vendor point-of-sale equipment such as a wireless vendor device (WVD) (20) and a long-range communications device (12) with credit or debit authorizations processors (30). In preferred embodiments, a WVD will communicate vendor identification data and a transaction purchase price to a WPD and a WPD user will determine whether to complete the transaction. The transaction may be completed by transmitting the vendor identification and purchase data to an authorization processor for credit or debit approval. Authorization approval or denial is transmitted to the WPD where the user is discretely notified of the outcome. If approved, the user may transmit the approval to the WVD to complete the transaction. Using the systems and methods of the present invention, vendors need not maintain long-range communications between points-of-sale and authorization processors or other parties. Purchasers also benefit from the discrete notification of credit or debit approval or rejection.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
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4 October 2001 (04.10.2001)

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(10) International Publication Number
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(51) International Patent Classification[6]: G06F 15/30, 17/60

(21) International Application Number: PCT/US01/09853

(22) International Filing Date: 27 March 2001 (27.03.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/536,273 27 March 2000 (27.03.2000) US

(71) Applicant: **IN2M.COM LLC** [US/US]; 4515 South Butternut Road, Holladay, UT 84117 (US).

(72) Inventor: **SMITH, Steven, B.**; 4515 South Butternut Road, Holladay, UT 84117 (US).

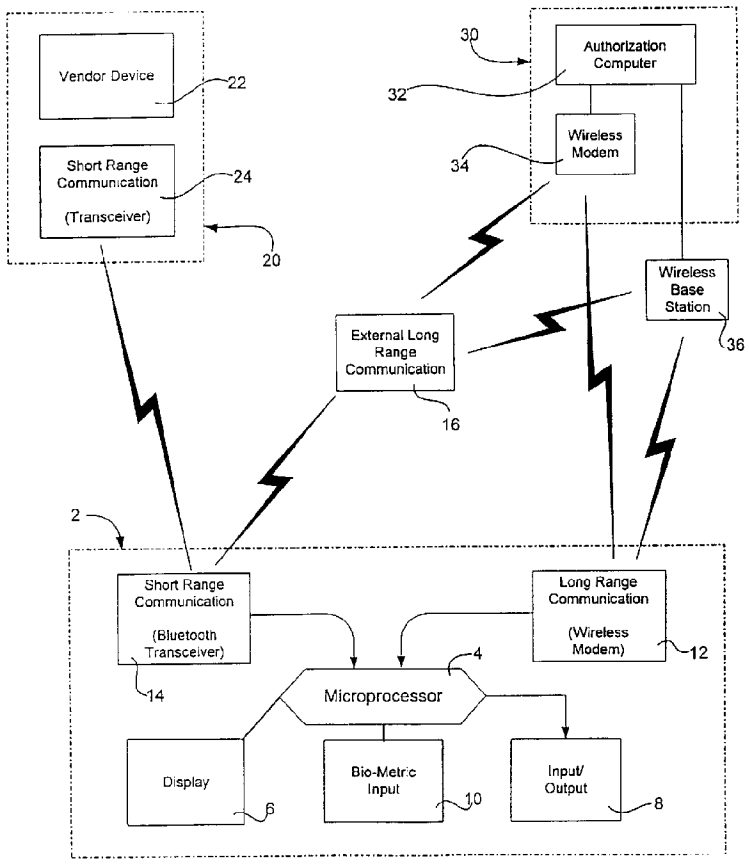
(74) Agents: **CONGER, Michael, M.** et al.; Kirton & McConkie, 1800 Eagle Gate Tower, 60 East South Temple, Salt Lake City, UT 84111 (US).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

*[Continued on next page]*

(54) Title: METHODS AND APPARATUS FOR WIRELESS POINT-OF-SALE TRANSACTIONS




(57) Abstract: The present invention relates to systems, methods and apparatus for making purchase transactions at a point-of-sale. A wireless purchase device (WPD) (2) comprising a short-range communications device (14) for communication with vendor point-of-sale equipment such as a wireless vendor device (WVD) (20) and a long-range communications device (12) with credit or debit authorizations processors (30). In preferred embodiments, a WVD will communicate vendor identification data and a transaction purchase price to a WPD and a WPD user will determine whether to complete the transaction. The transaction may be completed by transmitting the vendor identification and purchase data to an authorization processor for credit or debit approval. Authorization approval or denial is transmitted to the WPD where the user is discretely notified of the outcome. If approved, the user may transmit the approval to the WVD to complete the transaction. Using the systems and methods of the present invention, vendors need not maintain long-range communications between points-of-sale and authorization processors or other parties. Purchasers also benefit from the discrete notification of credit or debit approval or rejection.

WO 01/73575 A1

**Published:**

*with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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# METHODS AND APPARATUS FOR WIRELESS POINT-OF-SALE TRANSACTIONS

## The Field of the Invention

The present invention relates to methods and apparatus for point-of-sale transactions using wireless communication devices. Embodiments of the present invention utilize wireless purchasing devices (WPDs) to communicate with point-of-sale wireless vendor devices (WVDs) and arrange the electronic transfer of assets to complete a sale. WPDs of embodiments of the present invention may negotiate a purchase code with a WVD and obtain authorization to complete a purchase identified in the purchase code directly from a creditor or account holder. When authorization is approved, an authorization code is transmitted from the creditor/account holder directly to the WPD and a purchase authorization code is transmitted to the WVD to complete the transaction. Embodiments of the present invention may be used with human-operated vendor devices such as electronic cash registers or with automated vendor devices such as electronic vending machines.

## Background

Electronic transactions involving the transfer of money and pecuniary assets are common in our society today. Stocks and bonds may be purchased and traded using only electronic transactions. Goods and services are also commonly purchased over the telephone or via the Internet using credit or debit accounts with electronic authorization.

Retail vendors typically accept credit and debit cards which are verified and authorized using electronic communications methods. Nearly every significant retail vendor accepts some form of credit or debit card as remuneration for goods or services. The accounts accessed through these cards are typically identified by a number embossed on the card and a magnetic strip on the card's surface that is encoded with account information. Transactions involving a credit or debit card account require authorization from the organization who issues the card. This authorization is generally obtained at the point-of-sale by a vendor through electronic communications channels. A transaction amount is determined and the amount of the transaction along with the account identification information are transmitted to the organization which issued the card. If the account has sufficient credit or funds to cover the transaction amount and the account has not been deactivated for some other reason, the card issuer will send an authorization code to the vendor which indicates that the issuer will transfer the authorized amount to the vendor at an appropriate time.

Account information may be obtained by swiping the electronic strip of the card across a magnetic reader thereby eliminating the need for manual input. The transaction amount may also be transferred from an electronic cash register and combined with the account information automatically to make an authorization request.

These point-of-sale authorization request devices are typically connected to the card issuers or their representatives, sometimes known as authorization processors, through a conventional telephone line. Often a dedicated phone line is connected to the point-of-sale authorization device for quick access to authorization data.

These point-of-sale devices may also be connected via wireless telecommunications connections, generally with cell phone or cell modem technology. This wireless connection allows the point-of-sale device to be more portable, but still requires a dedicated or available communications link to the authorization processor.

Known authorization request systems and methods all employ a communications link between the vendor and authorization processor whether the link be a land line or a wireless link. These systems require the vendor to maintain a communications link for each sales terminal. For conventional, wired systems this may amount to multiple dedicated phone lines often with long-distance connection charges. For wireless systems, an expensive cell-phone-based account or other wireless provider account is required. These connections can be expensive to maintain and can cripple a vendor when service is interrupted.

A full-time communication link can also be impractical or uneconomical for low volume vendors who do not have sufficient profit to justify the connection costs. Vending points in remote locations may not justify the cost of a wireless connection.

With known systems and methods, each vendor must maintain a proprietary communications link between the vending point and the authorization processor. When multiple vendors occupy a single location, multiple communications links must be maintained thereby increasing energy demands and monopolizing available communications bandwidth.

The costs of vendor communication links add to vendor overhead which must be accounted for by increasing revenue, typically through increased product prices. Therefore, the consumer eventually pays the price for this communication and any associated inefficiency.

Wireless communication technology has progressed rapidly in recent years. Cell phones and other long-range communication devices have proliferated and are now commonplace among consumers. As technology advances, the cost of these devices is plummeting and even more widespread use is eminent. Mobile phones, pagers, two-way

radios, smartphones, personal digital assistants (PDAs) and other communicators are all available on the market.

Internet use is also skyrocketing with millions of new users logging on each year. Internet commerce now represents a significant portion of retail commerce and is used by millions of consumers each day.

Communications protocols exist which allow present generation electronic communications devices to interface with the Internet and access Internet resources. The Wireless Application Protocol (WAP) is an open, global specification that enables mobile wireless communications devices to access and interact with Internet information and services. WAP is a communications protocol and environment which can be built on nearly any operating system including PalmOS, EPOC, Windows CE, FLEXOS, OS/9, JavaOS and others and provides service interoperability between different device families. WAP works with most existing wireless communications networks such as CDPD, CDMA, GSM, PDC, PHS, TDMA, FLEX, ReFLEX, iDEN, TETRA, DECT, DataTAC, Mobitex and others. WAP developers operate Internet gateways specifically tailored for wireless communications device users. These devices typically have small displays, limited memory and less bandwidth that stationary, wire connected computers, therefore, WAP provides for use of eXtended Markup Languages (XMLs) such as the Wireless Markup Language (WML) which offers Internet content tailored for cell phones, PDAs and other wireless, portable communications devices.

Using WAP and similar technologies, vendors, news agencies, financial institutions and other providers allow cell phone and other portable communications device users to buy and sell securities, execute credit card transactions, make account transfers, make bill payments, receive and send e-mail, view news reports. These providers offer seamless integration between the Internet and wireless portable communication devices.

Wireless communication devices are also becoming commonplace in the electronics industry. Wireless networking of portable computers and associated devices is now replacing a large segment of the networking market. Wireless communication devices including wireless networking adapters, hubs and other equipment utilize radio transmitters and receivers to transmit data signals from one device or node to another. These radio transmitters and receivers must utilize a specific frequency band and protocol to accomplish this task. Since these wireless networks and communications areas may often overlap, standards, protocols and privacy protection are necessary. One current standard in the industry has been established by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and is known as IEEE 802.11. This standard comprises

communications standards, protocol and equipment specifications for wireless communication equipment including privacy and encryption provisions.

Another innovation in the wireless communications arena is the advent of short-range wireless networking between portable communications devices. One standard for this technology is known as Bluetooth®, and is being established by a collaborative group of communications and computing companies. Devices incorporating Bluetooth® technology will utilize a micro-chip transceiver for communications between devices. Bluetooth® devices will transmit in the previously unused 2.4 GHz range and will have a range of about 10 meters which may be extended to about 100 meters by increasing transmitter power. Bluetooth® technology promises to be a viable and economical networking solution for interconnection of cell phones, computers, printers, modems, computer peripherals, fax machines and other communications and computing devices. The size of the Bluetooth® transceiver makes it usable in devices as small as palm computers and cell phones.

Another established wireless connectivity standard is known as IrDA and employs infrared radiation to communicate between devices. IrDA is a point-to-point narrow angle, ad-hoc data transmission standard designed t operate over a distance of 0 to 1 meter at speeds of 9600 bps to 16 Mbps. It is typically used in a point-and-shoot fashion by pointing one device at another for direct data transmission.

The combination of some of the above technologies allows a user to use a single electronic device to communicate with other electronic devices in a short range network or direct data link while establishing a long-range communications connection with mobile phone or other technology.

## SUMMARY OF THE INVENTION

Preferred embodiments of the present invention provide systems, methods and apparatus which provide for short range communication with a point-of-sale device combined with long-range communication with a credit or debit authorization processor. As a non-limiting example, an embodiment of the present invention in the form of a PDA may communicate with a point-of-sale device to determine vendor identification and a sale amount. The vendor/sale data is combined with credit or debit account data and forwarded to an authorization processor as a request for authorization of the sale amount. The authorization processor processes the request and transmits an authorization approval or denial to the PDA through a long range communication system. The authorization is then transmitted to the vendor's point-of-sale device to complete the transaction.

Embodiments of the present invention allow for transactions with multiple vendors. A consumer with a wireless purchasing device (WPD) may enter an area in

which several vendors have point-of-sale devices which can communicate with the WPD. As the consumer enters communication range with the point-of-sale devices, a menu on the WPD is updated to reflect the products available from vendors in communication range along with associated prices and related data. A consumer may select from the available products and initiate the purchase. Vendor information, product identification and pricing data received from the point-of-sale devices is processed into purchase requests for each vendor selected and the purchase requests are transmitted to one or more authorization processors. If the purchases are authorized, the authorization approval is transmitted back to the WPD and the consumer completes the transaction by transmitting a charge or debit authorization to the point-of-sale devices thereby enabling product access or delivery of the purchased products.

Accordingly some embodiments of the present invention provide systems, method and apparatus for obtaining a point-of-sale purchase authorization.

Also, some embodiments of the present invention provide systems methods and apparatus for obtaining a point-of-sale purchase authorization for a purchase from a vendor who does not have a communications link with an authorization processor.

## BRIEF DESCRIPTION OF THE DRAWINGS

In order that the manner in which the above-recited and other advantages of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered to be limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

Figure 1 is a diagram showing components of a preferred embodiment of the present invention;

Figure 2 is a diagram illustrating the typical use of an embodiment of the present invention with a single WVD; and

Figure 3 is a diagram illustrating the typical use of an embodiment of the present invention with multiple WVDs.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrated and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing

description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

Preferred embodiments of the present invention comprise a portable electronic communications device which is capable of communicating with a vendor's point-of-sale device and capable of communicating with an independent financial institution such as a bank or credit lender. In many embodiments, these two communication functions will be achieved using two communications protocols or methods. One method will employ a short range communication or networking device to communicate with a vendor's point-of-sale device. The other method will use a long range wireless communication system to contact financial institutions for payment authorization and execution.

In reference to Figure 1, a preferred embodiment of a consumer's wireless purchasing device (WPD) 2 is shown comprising a microprocessor 4 for processing consumer input, communications functions and display functions as well as other functions. WPD 2 may also comprise a display 6 in preferred embodiments, however display 6 is not required for rudimentary embodiments. An input device 8 may also be part of WPD 2 to allow for consumer input and selection. WPD 2 may communicate with other electronic devices using a short-range communications device 14. Short range communications device 14 may be used to communicate with a vendor's point-of-sale device, such as wireless vending device (WVD) 20, with other WPDs, with external communication device or with other electronic devices. However, the key function of short range communications device 14 is to communicate with WVDs, and in some embodiments with external long range communication device 16. Short range communications device 14 may be a Bluetooth® transceiver or similar short range networking device or may be an Infrared transceiver such as an IrDA standard port as well as other devices.

Some embodiments of the WPD of the present invention will also comprise a long range communications device 12 for communication with an authorization provider 30. Long range communications device 12 may take the form of a cell modem, radio modem or other wireless communications device capable of transmitting and receiving data over a large area.

When a consumer already has possession of a cell phone or other long range communications device 16 which also has short range communications ability, such as a Bluetooth® enable cell phone, the consumer may prefer to use a less-expensive embodiment of the WPD which uses short range communications device 14 to interact with the external long range communications device 16 for contact with authorization provider 30.

Some embodiments of the WPD of the present invention may also comprise a biometric input device 10 to verify user identity. Biometric input device 10 may use thumb print analysis, retinal scan analysis or another identification method to identify the WPS user. Once the user is identified, user identity can be matched to account data to ensure that unauthorized users do not gain access to sensitive information or other user's accounts.

Embodiments of the present invention also comprise a wireless vendor device (WVD) 20 which is typically positioned at a point-of-sale for communication with WPDs. WVD 20 will generally comprise a short range communications device 24 configured to communicate with short range communications device 14 used in WPDs. As with communications device 14, device 24 may be a Bluetooth® transceiver, an IrDA port or another communications device. In situations where multiple vendors are accessible to a single WPD at the same time, a Bluetooth® transceiver or similar networking device is preferred to allow multiple party communications. Short range communications device 24 is connected to a vendor device 22 which is typically an electronic computing device such as an electronic cash register, an electronic vending machine, a bar-code reader or other device which may transmit and receive product and transaction information.

As embodiments of the present invention are to be used with credit and debit card accounts which generally require authorization before funds may be transferred, WPDs may communicate with authorization providers 30 using long range communication device 12 or 16. WPD communication device 12 or 16 may communicate with authorization long range communications device 34 using known wireless communications methods such as through the use of wireless modems. This communication may be direct between communication device 12 or 16 and 34 or may involve a wireless communications base 36 which receives and transmits wireless signals and converts them to a wired connections such as with a standard telephone line. Authorization communications device 34 provides access to authorization computer 32 which may authorize credit and debit transactions and execute transfers of funds to the appropriate accounts.

A variety of communication protocols and methods are known and commonly used in the industry, therefore, the information transfer used in some embodiments of the present invention is shown in a generic format in Figure 2. Typically a purchase transaction will commence by establishing communication between a WPD 2 and a WVD 20. WPD may receive product or service information from WVD which may be presented on the display 6 of WPD 2. In some embodiments, a consumer may then make

a selection between menu items presented on display 6 or otherwise indicate a desire to make a purchase. In some situations, a WVD may simply transmit a transaction amount and vendor identification to the WPD, such as when a cashier has tallied a total and seeks payment or when an automated vending machine offers a single selection. In most situations, the WVD 20 and WPD 2 will communicate 44 with or without vendor and consumer input until a total purchase amount is reached. When a transaction amount is established, the WPD 2 will use its long range communications ability to contact an authorization provider 30 to request authorization 46 of the credit or debit transaction. Authorization processor 30 will check the consumer's account to verify that sufficient funds or credit are available and make any other necessary verification as required. If authorization is denied, a denial 48 will be transmitted to the WPD 2 and the consumer will be notified on the WPD display 6 that the transaction cannot be completed. If the authorization is approved, an authorization approval 50 will be transmitted to the WPD 2 which will use its short range communications link to pass the authorization to the WVD to inform the vendor of the transaction so that the goods or services may be released.

Authorization by authorization processor 30 also causes a request to be transmitted from processor 30 to the customer's financial institution 40 to transfer funds from the customer's account to the vendor's account 42.

In this manner, the transaction may be completed without any direct communication between a vendor and an authorization processor or financial institution. This method allows a vendor to operate a WVD at a point-of-sale without the expense and inconvenience or a long range communication connection. This method also allows the consumer to retain confidential account information without disclosure to vendor personnel or exposure to the risks present in the vendor's system.

In reference to Figure 3, embodiments of the present invention which accommodate multiple, simultaneous vendors are illustrated. In these embodiments WVDs and WPDs will generally utilize wireless networking technology such as Bluetooth® transceivers or others to communicate. WVD1 61, WVD2 62 and WVD3 63 are present within communication range of a single WPD 2 and communication between WVDs 61, 62 and 63 and WPD 2 is initiated upon communication contact. In a preferred embodiment WVDs 61, 62 and 63 will transmit menu options to WPD 2 to inform the consumer of available products and to identify the vendors associated with the WVDs. WVDs 61, 62 and 63 may be electronic vending machines or other vendor devices. A consumer may view the menu 60 on the WPD display 6 to see the available products and make selections with WPD input device 8. When a final selection is made

by the consumer, the WPD 2 will request authorization for the purchase by contacting authorization provider 30. Authorization provider 30 may request user identification before approval. Identification may be provided through the use of a confidential PIN number or for increased security may be provided by biometric identification device 10. When identification is verified, authorization provider 30 will check account status and approve or deny the transaction according to internal rules. If approval is granted, an authorization approval is transmitted to WPD 2 and a transfer of funds request is transmitted to the consumer's financial institution 40 who will transfer appropriate amounts of funds to the accounts 71, 72 and 73of vendors who were selected in the consumers menu selection on the WPD 2.

When the WPD 2 receives the authorization approval, the approval is displayed to the consumer on display 6 (in embodiments with displays) and a transaction finalization command is transmitted from WPD 2 to WVDs 61, 62 and 63 to instruct WVDs to release the purchased products, provide the purchased services or otherwise credit the consumer for the purchase.

I claim:

1. An apparatus for completing wireless point-of-sale purchase transactions comprising:
    a long range communications device for communicating with an authorization processor;
    a short range communications device for communicating with a point-of-sale wireless vendor device;
    a microprocessor; and
    an input device.
2. The apparatus of claim 1 further comprising a display.
3. The apparatus of claim 1 further comprising a bio-metric input device.
4. The apparatus of claim 1 wherein said long range communications device is external.
5. A system for completing wireless point-of-sale purchase transactions comprising:
    a wireless purchase device comprising
        a long range communications device for communicating with an authorization processor,
        a short range communications device for communicating with a point-of-sale wireless vendor device,
        a microprocessor, and
        an input device; and
    a point-of-sale wireless vendor device comprising
        a short range communications device, and
        a vendor computing device.
6. The system of claim 5 further comprising an authorization processor connected to a long range communications device.
7. The system of claim 5 further comprising a display for said wireless purchase device.
8. The system of claim 5 further comprising a bio-metric input device for user identification.
9. A method for completing wireless point-of-sale purchase transactions comprising the acts of:
    communicating between a WPD and a WVD to identify a vendor and establish a purchase price;
    requesting purchase authorization from an authorization provider;

transmitting a transaction denial to said WPD if said purchase is not authorized by said authorization provider thereby terminating said request;

transmitting a transaction approval to said WPD and transmitting a request to transfer funds to a financial institution if said purchase is authorized by said authorization provider; and

transmitting a transaction finalization command to said WVD to request transaction release.

10. The method of claim 9 further comprising the act of identifying a user with a bio-metric input device.

11. The method of claim 9 wherein said communicating between a WPD and a WVD is effectuated using short range wireless transceivers.

12. The method of claim 9 wherein said requesting purchase authorization is effectuated using a long range, wireless communications device.

13. A method for completing wireless point-of-sale purchase transactions comprising:

establishing a wireless network between a WPD and a WVD;

communicating a vendor identification and a purchase price to said WPD over said wireless network;

requesting purchase authorization from an authorization provider;

transmitting a transaction denial to said WPD if said purchase is not authorized by said authorization provider thereby terminating said request;

transmitting a transaction approval to said WPD and transmitting a request to transfer funds to a financial institution if said purchase is authorized by said authorization provider; and

transmitting a transaction finalization command to said WVD to request transaction release.

14. The method of claim 13 wherein said requesting purchase authorization is effectuated using a long range communications device.

15. The method of claim 14 wherein said long range communications device is a wireless device.

16. The method of claim 14 wherein said long range communications device is integral to said WPD.

17. The method of claim 14 wherein said long range communications device is external to said WPD, but operated by a WPD user.

18. The method of claim 13 wherein said requesting purchase authorization is effectuated using a wireless phone.

19. A method for completing wireless point-of-sale purchase transactions comprising steps for:

communicating between a WPD and a WVD to identify a vendor and establish a purchase price;

requesting purchase authorization from an authorization provider;

transmitting a transaction denial to said WPD if said purchase is not authorized by said authorization provider thereby terminating said request;

transmitting a transaction approval to said WPD and transmitting a request to transfer funds to a financial institution if said purchase is authorized by said authorization provider; and

transmitting a transaction finalization command to said WVD to request transaction release.

20. The method of claim 19 further comprising a step for identifying a user with a bio-metric input device.

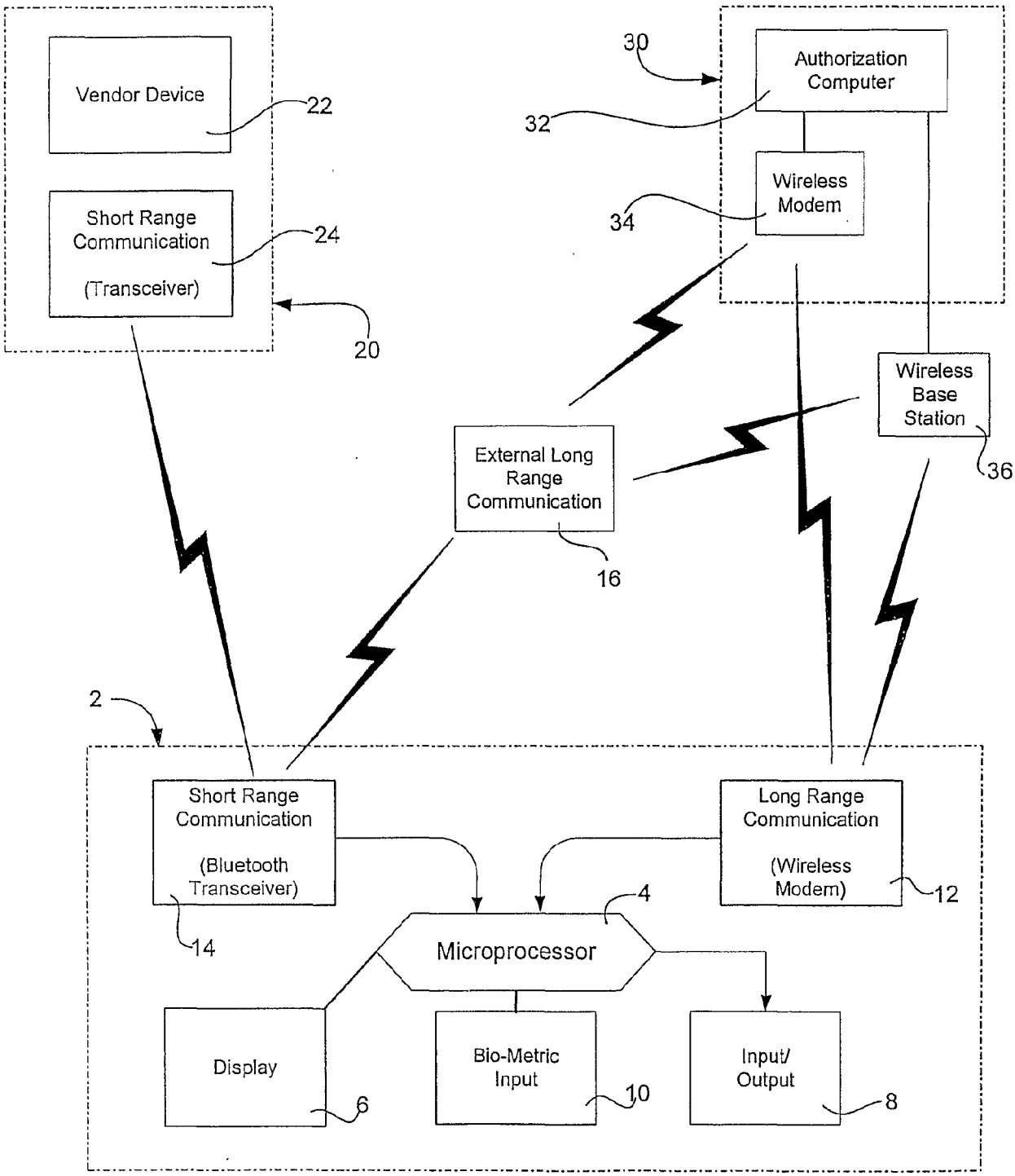
Vendor Device
22
Short Range Communication
(Transceiver)
24
20
30
Authorization Computer
32
Wireless Modem
34
Wireless Base Station
36
External Long Range Communication
16
2
Short Range Communication
(Bluetooth Transceiver)
14
Long Range Communication
(Wireless Modem)
12
4
Microprocessor
Display
6
Bio-Metric Input
10
Input/ Output
8

Figure 1

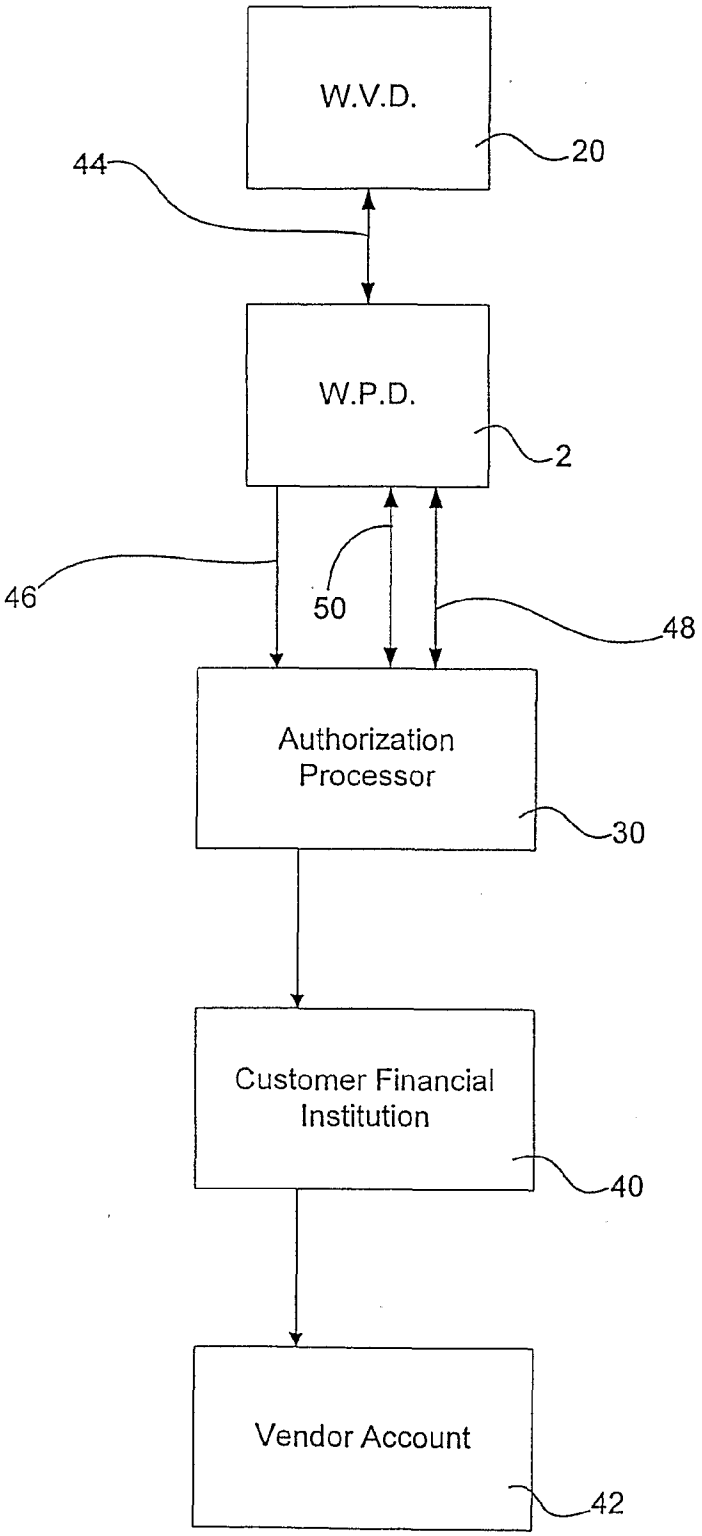
W.V.D.
20
44
W.P.D.
2
46
50
48
Authorization Processor
30
Customer Financial Institution
40
Vendor Account
42

Figure 2

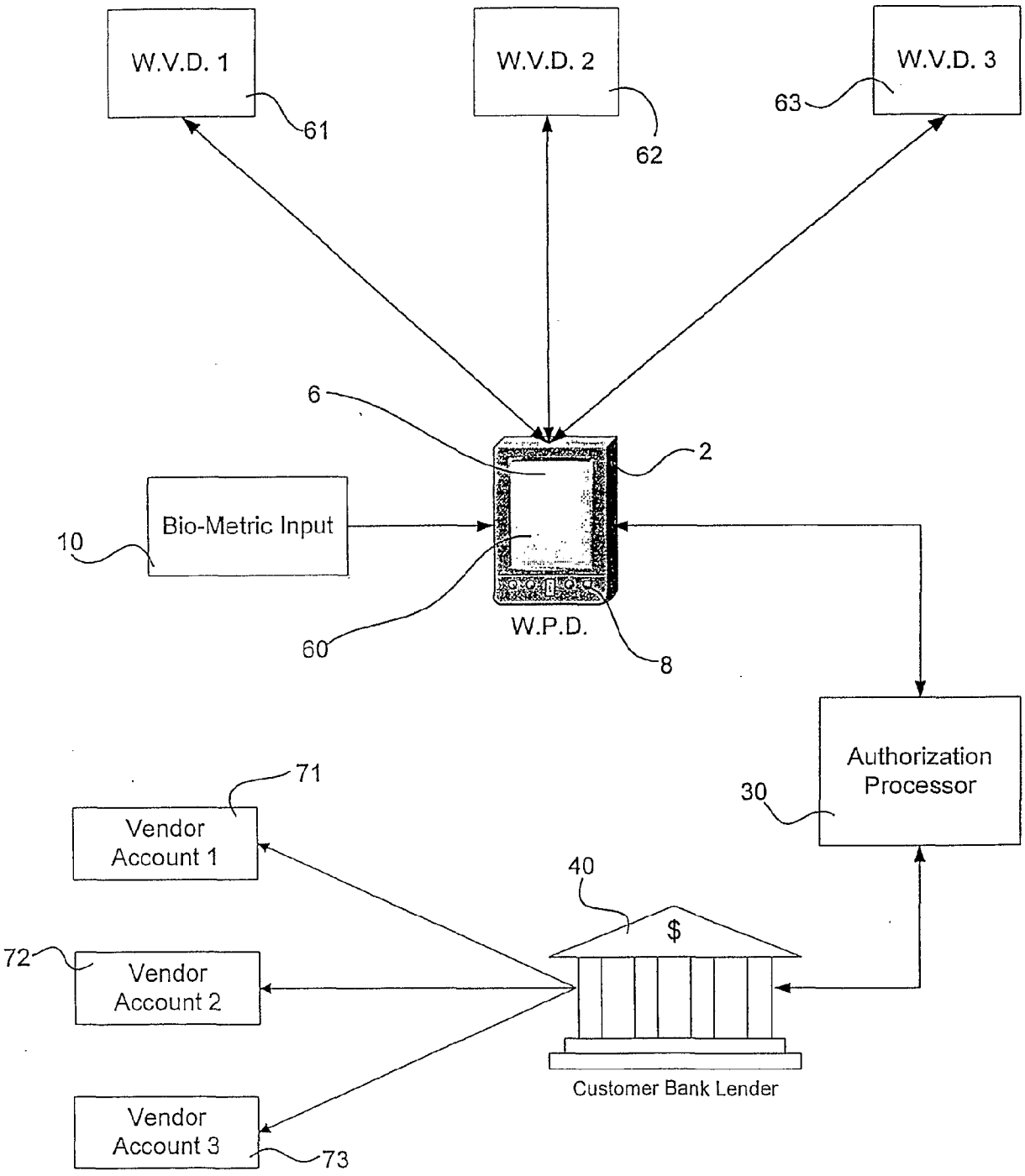
W.V.D. 1
61
W.V.D. 2
62
W.V.D. 3
63
6
2
Bio-Metric Input
10
60
W.P.D.
8
Authorization Processor
30
71
Vendor Account 1
40
$
72
Vendor Account 2
Vendor Account 3
73
Customer Bank Lender

Figure 3

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/09853

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) : G06F 15/30, 17/60
US CL : 705/39, 41, 44; 380/24, 49; 235/379

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 705/39, 41, 44; 380/24, 25, 30, 49; 235/379, 380

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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X<br>---<br>Y | US 5,952,638 A (DEMERS et al.) 14 September 1999 (14.09.1999), see the entire document. | 1-8<br>---<br>9-20 |
| Y | US 4,630,201 A (WHITE) 16 December 1986 (16.12.1986), see the entire document | 9-20 |
| A | US 4,115,870 A (LOWELL) 19 September 1978 (19.09.1978), column 2, lines 5-28. | 1 |
| A | US 5,500,890 A (ROGGE et al.) 19 March 1996 (19.03.1996), column 4, lines 7-36. | 1 |
| A | US 5,797,126 A (HELBLING et al.) 18 August 1998 (18.08.1998), see Figure 2. | 1 |
| A | US 5,857,023 A (DEMERS et al.) 05 January 1999 (05.01.1999), see the entire document. | 1-8 |
| A | US 5,955,961 A (WALLERSTEIN) 21 September 1999 (21.09.1999), see the entire doucment. | 1 |
| A | US 5,979,757 A (TRACY et al.) 09 November 1999 (09.11.1999), see the entire document. | 1, 9 |
| A | US 6,021,399 A (DEMERS et al.) 01 February 2000 (01.02.2000), see the entire document. | 1-20 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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

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

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

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

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

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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 29 June 2001 (29.06.2001) | 01 AUG 2001 |
| Name and mailing address of the ISA/US<br>Commissioner of Patents and Trademarks<br>Box PCT<br>Washington, D.C. 20231<br>Facsimile No. (703)305-3230 | Authorized officer<br>Richard E. Chilcot, Jr. Peggy Harrod<br>Telephone No. 703-308-1020 |

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## Abstract

In a security system for network communications with client devices, each client device has a communication module for communicating with at least one server over a network, a data storage module for storing one or more covert data values of one or more operational events at the client device, and a covert identifier generating module which creates at least one covert identifier based on the stored covert data values. The covert identifier is provided in one or more network messages to the server, or otherwise sent to the service provider, and may be provided in response to a specific request received over the network, or routinely in one or more messages normally involved in network communications. The server compares covert identifiers received from client devices having the same client identifier in order to detect possible clones.

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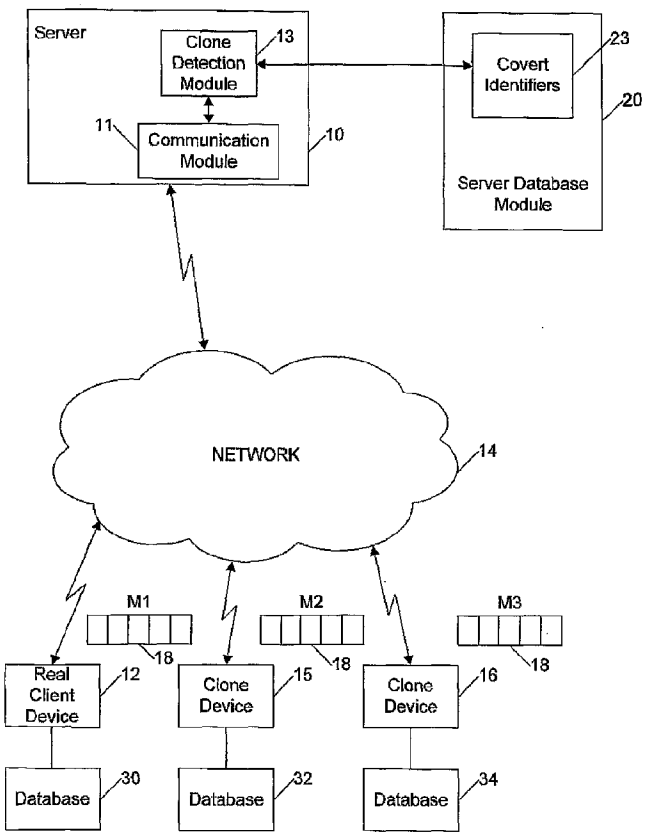
*[Continued on next page]*

(54) Title: NETWORK SECURITY SYSTEM AND METHOD




(57) Abstract: In a security system for network communications with client devices, each client device has a communication module for communicating with at least one server over a network, a data storage module for storing one or more covert data values of one or more operational events at the client device, and a covert identifier generating module which creates at least one covert identifier based on the stored covert data values. The covert identifier is provided in one or more network messages to the server, or otherwise sent to the service provider, and may be provided in response to a specific request received over the network, or routinely in one or more messages normally involved in network communications. The server compares covert identifiers received from client devices having the same client identifier in order to detect possible clones.

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FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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# NETWORK SECURITY SYSTEM AND METHOD

## Related Application

[01] The present application claims the benefit of co-pending United States provisional patent application No. 60/760,475 filed January 20, 2006, which is incorporated herein by reference in its entirety.

## Background

### 1. Field of the Invention

[02] The present invention relates to network communications between a server and client device, and is particularly concerned with a network security system and method for detecting clones of true or properly registered client devices attempting to steal services without payment or otherwise mimic a real client device.

### 2. Related Art

[03] In a distributed computing environment, pirates attempt to steal services by creating multiple clients with credentials identical to a valid client or authorized subscriber, thereby allowing non-paying subscribers to share (steal) the services of a paying authorized subscriber. Since the credentials appear valid, the server sends broadcast keys or the like to such clones, enabling non-authorized subscribers to view broadcasts, engage in two-way communications, or the like. Such cloning techniques are a significant problem to network providers. Pirates also attempt to duplicate or clone client devices such as smart cards which are used by authorized individuals as credit or automated teller machine (ATM) cards, in mobile phones, for high security identification and access-control cards, public transport cards, and other purposes. Cloning of smart cards also causes significant problems to providers of such services as well as the authorized card users.

[04] Therefore, what is needed is a system and method that reduces or overcomes these significant problems found in the conventional systems as described above.

## Summary

[05] Embodiments described herein provide for the addition of covert security data to normal messages between a client device and server, so that a server can determine if more than one client device communicating with the network has the same registered

credentials or client identifier (client ID), indicating the presence of one or more cloned client devices.

**[06]** According to one aspect, a security method for detecting cloned client devices is provided, which comprises receiving a message from a client device at a server, the message containing a covert identifier derived from one or more operational events at the client device, determining whether the covert identifier matches a covert identifier for the client device stored at the server, and reporting detection of a cloned client device if the covert identifiers do not match.

**[07]** The covert identifier stored at the server may be based on one or more covert data items generated by the server or by the client device, or both, and may have been received in a previous message which purports to be from the same client device. If the messages originate with different client devices, such as a real client device and a cloned client device, the covert identifiers do not match, since the timing and values of operational events at one client device are not identical to those at another client device. The covert identifier may be a value generated by or based upon one or more operational events, for example the time of occurrence of an event or the number of times a particular event has occurred at the client device, or may be a transformed version of one or more covert data values using a hashing function or the like.

**[08]** The client device may be any type of computing device capable of receiving and/or sending data over a network, such as set top boxes (STBs), personal computers, game consoles, cellular phones, personal digital assistants (PDAs), video equipment, smart cards, and the like. The covert identifier generated for the client device may comprise one or more covert data values collected and stored by a client device, or a transformed version of such covert data values, and may be based on any operational characteristic or event of a client device which changes over time and which can be stored by the client device, or by the client device and server. The covert identifier may be a token or value provided by the server, or may be a combination of client and server generated covert data values. An operational characteristic of a client device as referenced herein is an event which occurs at or in connection with the client device and which is unique to that particular client device, such as a time at which a predetermined operational event occurs, for example sending or receiving a predetermined message at the client device or server, a firmware update, a delay time between sending a message to the network and receiving a response from the network, the time when the nth network packet is received at the client device, the number of times a certain operational event occurs, a token sent to the client

device from the server, a count of Entitlement Control Message (ECM) packets received, a channel the client device was tuned to at a predetermined time, number of channel changes in a predetermined time, a register value contained on a chip in a client device, and so on. In the case of a smart card, the operational characteristic used to generate covert data may be a time of first use of the smart card, the microsecond time when the smartcard was used for a certain operation, the total number of data bytes processed by the smartcard at a certain time or captured at a certain event such as a broadcasted event trigger, or any other operational data, count, or event occurring during the use of the smartcard, for example. In the case of a mobile phone, call logs at the phone may be used to generate the covert identifier, by processing the call log with a hashing function to generate an identifier which is unique to that phone. The operational characteristic is one which is created by operation of a particular client device and is therefore not easily hacked or duplicated by a cloned client device, for example the microsecond time of day that an event occurred or a trigger occurred, or new data was captured. Covert identifiers may be updated periodically using new operational events to provide the covert data values, to further reduce the risk of successful hacking.

**[09]** Some examples of possible covert data values which may be used to create a covert identifier unique to a client device are the last time a particular type of message was sent from or received by the client device, the number of times a particular event has occurred, such as number of items purchased, number of transient key updates received, number of times a certain type of data message or network packet was received, or number of times a client device has performed a certain event, the internet protocol (IP) address used by the Dynamic Host Configuration Protocol (DHCP) server when used in the system, values obtained from other network devices such as cable modem or signal strength, value of a client data parameter after a predetermined number of events has occurred, and the like. A covert data value may comprise data received in a message from the server and used in a subsequent message to the server. This value may be updated by the server at each subsequent communication. In this way, the server recognizes that there is a potential clone device if a message is received which does not contain the updated covert data value, i.e. there is more than one client device with the same credentials on the system. More than one covert data value may be used for the covert identifier in each message for added security. In the case of a smart card, the covert identifier may be based on the time the card was used, the number of items purchased, or the like.

[10] Event triggers may be used in some embodiments to update or modify covert data values or start a count or timer which results in updated covert data values used to generate a new covert identifier, or modifies the messaging protocol or data contained in a message between a client and server.

[11] In another aspect, a security system for detecting cloned client devices is provided, which comprises a network server data storage module which stores a plurality of sets of client credentials or client identifiers (ID) for a plurality of authorized or real client devices and also stores covert identifiers based on operational characteristics of a client device which are received in messages from client devices, and a covert data processing module which compares a covert identifier in a message received from a client device with a previously stored covert identifier corresponding to the same client ID and which creates a clone detection report if the covert data identifiers do not match.

[12] If the network is a two-way network, covert identifiers based on collected operational events are exchanged during normal network communications. If the network normally operates as a one-way network but has a return channel for certain client communications, predetermined covert data values based on usage of the device are collected and used to create covert identifiers stored by client devices. The covert identifiers are sent to the server in messages via the return channel when available, for example during a periodic renewal process. The server stores the first covert identifier for a certain subscriber. If a covert identifier is later received which purports to originate with the same client device, a clone detection report is issued by the server.

[13] According to another aspect, a client device is provided which includes a covert data generating module for generating a covert identifier based on data generated by operation of the client device, and a covert data storage module for storing the covert identifier. If the client device is intended for use in a two way network environment, or in a one way network environment including a return channel for certain communications, the client device may also include a message generating module for generating messages containing the currently stored covert identifier. The covert identifier is subsequently sent to a network server over a network in a covert data field embedded in a message, or as a data value in response to a request from the server or any combination thereof. The message may be a type of message normally sent in two-way communications to a network, or in a message as part of a periodic renewal procedure or other standard message if the client device is normally involved only in one way communications with a network.

[14] Where there is no return channel for a one way network service, the client device creates and stores a client identifier which may be updated periodically based on new events at the client device. The client device or a network server may include a service code generating module which generates a service code message at a client device at predetermined intervals. This message may ask subscribers to call a service center or send a short message service (SMS) text message via a mobile phone or internet connection to the service center, providing the subscriber identification and the currently stored covert identifier in the client device. Since the currently stored covert identifier is different for a real client device and a cloned client device, because they were operated differently, the service center can determine when two messages have been received with the same client or subscriber identification but with different covert identifiers. The service center can then take additional steps to determine which client device is associated with the authorized subscriber, and renews only that client device, cutting off service to any other client device using the same subscriber or client identification.

[15] The covert identifier is generated by operational events occurring during actual operation of a client device. Because the operational events occur after manufacturing the client device and are based on how the subscribers use the client devices, the operational events are unique to a particular client device. These operational events are different even between cloned client devices, because cloned client devices do things differently after they are powered-on, and it is the difference in operation that is used to generate the covert identifier. The covert data therefore provides a unique identifier for a particular client device which is stored by the client device and subsequently used in messages to a server. Where the client device is normally used only in one way network communications, the unique covert identifier can be provided to the network in a periodic renewal procedure, or may be requested by a network server if cloning is suspected.

[16] The covert data generating module may be incorporated in a central processing unit of the client device, which maybe embodied in a single chip (system on a chip or SOC) in some cases, such as in a smart card, cellular phone, or the like. The covert data storage module may also be incorporated in the central processing unit (CPU) or a separate data base associated with the central processing unit, or memory internal or external to the CPU.

[17] A client device message format in one embodiment comprises a message identifier field, a covert data field, and at least one additional data field containing the message to be communicated to the server, such as a client identification field or key request, or as part

of a message or message ID. The message type may be a logon message, a broadcast key request message, an e-commerce purchase message, a request to change channels, a subscription renewal message, or the like. If the message type is a logon message, the additional data fields contain the user name and password. The covert data field contains a covert identifier which may comprise one or more covert data values or items or a transformed version of such covert data values. The covert identifier can be used by the server on receipt of the message to determine whether more than one client device is using the same credentials. More than one message type may contain a covert identifier.

**[18]** In one embodiment, the current covert identifier is sent to a server from a client device as part of normal messages such as logging onto a system, requesting a decryption key, performing an e-commerce transaction, or other messages and events that occur normally within a system. Covert data values used to create the covert identifier may be based on various events, and event triggers may be used to define events which trigger the updating or modification of a previously stored covert identifier. Covert identifiers added into the normal messaging between a client and server do not require added messages or added acknowledgements between the client and server, reducing the likelihood that a hacker can monitor the protocol and determine how to hack a system. As such, a hacker who is attempting to steal services by cloning subscriber credentials, for example, of a set top box (STB), also needs to have knowledge of the meaning of the covert identifier and the triggers that cause a change in the covert identifier to assure that authentic STBs and cloned STBs have the same covert identifier. More than one covert data value may be used to create covert identifiers, for example a client library of two or more covert data values may be used to create covert identifiers in each selected client message to a server. The client library of covert data values is periodically updated, making it more difficult to conceal cloned devices from a server. In alternative embodiments, the covert identifier can also be sent with separate messages between the client and server.

**[19]** The security system may also include a renewal process designed to identify suspected clone devices. The renewal process may be initiated in response to a clone detection report generated by a network server, or may be carried out at periodic intervals or when clones are suspected for other reasons. The renewal process is designed to re-authorize only a single client device when several such devices are using the same credentials.

[20] Other features and advantages of the present invention will become more readily apparent to those of ordinary skill in the art after reviewing the following detailed description and accompanying drawings.

## Brief Description of the Drawings

[21] The details of the present invention, both as to its structure and operation, may be gleaned in part by study of the accompanying drawings, in which like reference numerals refer to like parts, and in which:

[22] **Figure 1** is a block diagram illustrating a network with a real or authorized client device and some cloned client devices communicating with a server in one embodiment of a security system for detecting potential cloned client devices;

[23] **Figure 2A** is a diagram illustrating data fields in a prior art user logon message;

[24] **Figure 2B** is a diagram illustrating data fields in one embodiment of a user message containing a covert identifier used at the server in one embodiment of a system for detecting potential cloned client devices;

[25] **Figure 3** is a block diagram illustrating a client device configured to insert a covert identifier in messages according to one embodiment;

[26] **Figure 4** is a flow diagram illustrating one embodiment of a method of detecting a cloned client device;

[27] **Figures 5A and 5B** are flow diagrams illustrating one embodiment of the clone detecting method;

[28] **Figures 6A to 6F** illustrate messages generated at various stages in the method of Figures 5A and 5B;

[29] **Figure 7** is a flow diagram illustrating an embodiment of a method for inserting covert identifiers in messages between a client device and a server;

[30] **Figure 8** is a flow diagram illustrating one embodiment of a service renewal method using covert identifiers; and

[31] **Figure 9** is a flow diagram illustrating a modification of the method of Figure 8 for use in a one way network environment having no return channel from a client device.

## Detailed Description

[32] Certain embodiments as disclosed herein provide for detection of more than one client device using identical credentials. For example, one method and system as disclosed herein allows for detection of potential clone devices using a covert identifier

based on values of operational events specific to a client device which is added into the normal messaging between a client device and a server.

[33] After reading this description it will become apparent to one skilled in the art how to implement the invention in various alternative embodiments and alternative applications. However, although various embodiments of the present invention are described herein, it is understood that these embodiments are presented by way of example only, and not limitation. As such, this detailed description of various alternative embodiments should not be construed to limit the scope or breadth of the present invention as set forth in the appended claims.

[34] In the following description, a client device may be any type of device capable of computing and receiving data from a network, such as a set top box (STB), personal computer, game console, cellular phone, personal digital assistant (PDA), personal media player, video equipment such as a digital video receiver (DVR), digital video disc (DVD) player (DVD), compact disc (CD) player, smart card, or the like. An authentic or real client device is the device which is properly registered with the server for receiving services over a network, or local services such as banking, purchases, and the like authorized by a network, as in the case of a smart card. A cloned client device is a device which has identical credentials to a real client device properly registered for service on the network, and which is used by an unauthorized or non-paying user in an attempt to obtain money or services without authorization. The terms "covert data", "covert data value" and "covert data item" are used to indicate unique data values based on operational characteristics of a client device, e.g. values created by operation of a particular client device or communication of that device with a server, or on tokens or values based on operation of a client device which are created by the server and embedded in messages to the client device. Such values are covert because their nature makes them difficult for hackers to detect and duplicate in cloned client devices, and because the data is generated after manufacturing. The term "covert identifier" indicates an identifier unique to a specific client device which is generated based on covert data values associated with operation of that device, and may comprise one or more actual covert data values in some embodiments, or may be a transformed version of such data values using a hash function or seeding a random number value or performing some other transform on the data. The term "event trigger" is used to indicate events that trigger the updating or modification of the covert identifier contained in a messaging protocol between a client device and server.

An "event counter" counts events performed by a client device, and may be used as an event trigger when the number of counted events exceeds a threshold.

**[35]** Figure 1 is a block diagram of a network security system incorporating clone detection according to one embodiment in which a server 10 communicates with a real or authorized client device 12 over a network 14, and a number of cloned client devices 15, 16 using identical client credentials also send messages to the server 10 over network 14. One, two or more clone devices may attempt to use network services at any one time by posing as client device 12. Computing environment pirates often attempt to steal network and other services by creating multiple clients with identical credentials, thereby allowing non-paying subscribers to share or misappropriate the services of a paying authorized subscriber.

**[36]** As illustrated in Figure 1, the server 10 is linked to server data base (DB) 20 which has a data storage module 23 for storing covert identifiers which may be received from client devices in messages and/or generated by the server. As noted above, each covert identifier is based on operational events at a specific client device. Server 10 has a communication module 11 which controls network communications and a clone detection module 13 which compares covert identifiers in messages received from client devices with previously stored covert identifiers in module 21, as described in more detail below. Server 10 has additional standard server processing and control modules which are not illustrated.

**[37]** In the system of Figure 1, client device 12 sends a message M1 to the server 10, while clone devices 15, 16 send similar messages M2 and M3 to the server. These messages may be sent in any sequence, and the server is adapted to detect the presence of one or more potential clones regardless of the order of transmission of messages M1 to M3. Each message is adapted to include a covert identifier 18 embedded in a predetermined covert data field or portion of the message. Covert identifiers for client devices communicating with the server are associated with the client credentials for a client device and stored in covert data storage module 23 for comparison with future covert identifiers received from one or more client devices having the same credentials, as described in more detail below. Each true and cloned client device has a data base or memory storage (RAM, ROM, FLASH, EEPROM) or register storage 30, 32, 34, respectively, in which the covert data values are stored and updated at the predetermined event triggers. Although the data base is shown separate from the client device in Figure 1, it may be housed in the client device or may be part of a central processing unit or system

on a chip (SOC) in the client device, or device memory such as RAM memory, Flash memory, Secure Memory, and the like.

[38] A client device (real or cloned) 12, 15, or 16 is illustrated in more detail in Figure 3. The client device may be any client device configured for communication over a network, such as a set top box, personal computer, game console, mobile phone, PDA, portable media player, DVD player, DVR, or a smart card, or the like. The client device has an associated data storage module 30, 32, 34 which is shown separately but may be incorporated in the same housing as other modules of the client device, or on the same chip as the other modules in some cases. The client device also has a communication module 17 for controlling network communications with server 10, a covert identifier generating module 19 for creating covert identifiers based on covert data values, event triggers or data received from the server, and a message formatting module 28. Client devices also include standard client device processing and control modules which are not illustrated in Figure 3. The data storage module has a covert data table module 29 for storing the current set of covert data values, as described below. Where the covert identifier is a transformed version of the covert data values, the current covert identifier or matrix of covert data values or group of covert data values is also stored in module 29.

[39] In one embodiment, message formatting module 28 is adapted to insert or embed the current covert identifier in one or more types of message sent to the server. In another embodiment in which the client device is used only to receive one way network communications and does not have access to a return channel to the network, message formatting module 28 is eliminated and the covert identifier generating module is configured to display the currently stored covert identifier in the form of a unique identification code to the user of the client device in connection with a periodic subscriber renewal process, as described in more detail below in connection with Figure 9.

[40] In one embodiment, the covert security data or identifier 18 is based on operational characteristics of the device from which the message is transmitted. Such characteristics are difficult or impossible to duplicate in a clone of the client device, since cloned client devices are not operated identically to authentic or real client devices and operational events such as messages, updates, and the like occur at different times in different devices. Obtaining micro-second identical events in real world client devices is nearly impossible. An operational characteristic of a client device is a value unique to that specific client device which is generated based on operation of the client device, such as a time at which a predetermined operational event occurs, for example sending or receiving a

predetermined message at the client device or server, a firmware update, a delay time between sending a message to the network and receiving a response at the network, time when the nth network packet is received at the client device, the number of times a client device performs a certain operational event in a selected time period, a token sent to the client device from the server, a count of ECM packets received, a channel the client device was tuned to at a predetermined time, number of channel changes in a predetermined time, a register value contained on a chip in a client device at a certain time, and so on. It turns out that there are an unlimited number of operational data values that can be used to generated covert data values (or data values unique to the operation of a client) because the exact data value is not important but what is important is that the likelihood of the data value being different based on the operation of two identical devices is great. If two or more client devices using the same credentials are communicating over the network, such operational characteristics are not identical from one client device to the other, and are uniquely created by operation of a particular client device by a user. Such operational characteristics and the covert identifiers based on such characteristics therefore cannot be easily hacked or duplicated by a cloned client device. Operators of cloned client devices are unlikely to be able to obtain such characteristics of the true or authentic client device, and would not normally even be aware of which specific operational characteristics are used to create the covert identifier, and in one embodiment the covert data values change between different versions of the client software.

**[41]** The server extracts the covert identifier received in a message from a device having certain credentials, and compares this identifier with those received in previous messages apparently from the same device. If there is no match, it is likely that one or more clones are being used, and the server can provide appropriate notification of likely clone detection to the system operator for further action. Since the server cannot determine which of several client devices with identical credentials sending messages are cloned devices, the requested service is provided to the devices, in addition to the clone detection notification to the operator.

**[42]** In one embodiment, a covert identifier is transmitted in ordinary messages exchanged between the client and server. For example, assume that the client needs to log onto a system and a logon message is defined. The standard logon message includes a user name and password. In one embodiment, the logon message includes a covert identifier 18 in addition to the user name and password. When the client device attempts to logon to a system, the client device provides standard logon information such as user

name and password and the covert identifier is embedded in the logon message (or any message or all messages) forming a logon command that includes the covert identifier as part of the standard logon message. The logon message contains the user name, password, and additional bytes of data containing the covert identifier. In one embodiment, the data items or values contained in the covert identifier or used to generate the covert identifier change at different times based on operating events within the client, or change based on time of day, or based on a time period elapsing after a certain event, so that the covert identifier can be updated either by changing covert data values at a particular time or by adding new covert data items to previous covert data items in essence increasing the number of covert data items for a particular client.

**[43]** Any standard message exchange between a client device and server may be used for detecting clones, such as an initial logon message. A covert identifier can be combined with normal messages and/or events such as when a client logs into a system. In addition to information typically found in a logon such as the client user name and password, the covert identifier can be added to the logon message which is specific to operation of a certain client device, such as the last time the user logged into the network or the time difference between the current logon and the prior logon. Covert data can be applied to all messages in a communication system or only selected messages, such as the logon message or other types of messages.

**[44]** Figure 2A illustrates a conventional log on message protocol as currently used. This message includes a message identifier field (ID) 21 which defines the message type from a group of messages supported on the system and which is typically unique for each message in a system. It may also include an optional sequence number field 22 which contains a unique number for each message of any type in the system, and is typically an incremental count that allows the system to eliminate message replay attacks by verifying the sequence number is new before processing the message. When the message is an initial logon message, it also has a user name field 24 which contains the user name for a user or client device on the system registered for the service or associated with a subscriber account with the service provider, and a password field 25 which contains the password for the user associated with an account or service. The password is provided when the user or subscriber first subscribes or registers with the system or service provider, and is verified by the server in subsequent requests for service by the user. Services can be accessed or the user can purchase items using the service only after the password is correctly provided in password protected systems. In addition, covert data can be used as

part of password salting for each client with the server side being aware of the covert data used to salt the password or data, or the server side downloading the encryption key or salting key into the client. Such passwords are sometimes obtained by hackers and used in conjunction with clone devices in attempting to obtain services without payment.

[45] Figure 2B illustrates an embodiment of a modified initial logon message which contains a covert identifier in covert data field 18 in the regular log on message structure. The ID field, sequence number field 22, user name 24, and password 25 are identical to the corresponding fields of Figure 2A, but the message is modified to provide a covert identifier in a data field 18 between the fields 22 and 24. The covert data field 18 may be provided at other locations in the message in other embodiments, and may be provided in different types of messages such as request broadcast key messages, e-commerce purchase messages, change channel messages, and the like. The covert identifier may be provided in only one specific type of message between a device and server, or may be provided in each message sent by the device, or intermittently in various messages. Intermittent transmission of covert identifiers may make such identifiers harder to track by potential hackers. Because encrypted messaging is always more secure than unencrypted messaging between client and server, in one embodiment covert data is transmitted over an encrypted connection such as Internet Protocol Security (IPSec), or secure socket layer (SSL) or other form of encryption between client and server.

[46] As illustrated in Figure 1, each of the messages M1, M2 and M3 has a covert identifier in field 18, but the covert identifiers in messages M2 and M3 do not normally match that of message M1. This is because the covert identifiers in one embodiment are based on covert data values generated by operational characteristics or operational events of the client device, such as time of sending or receiving certain messages at the client device or server, number of times a certain type of data message or network package was received, and the like. The covert identifier may comprise different operationally generated covert data values contained in different regions of the covert data field, or may comprise a transformed version of such covert data values. Such values are extremely unlikely to be identical in cloned client devices to the covert data values at a real client device, since the operation of cloned client device does not normally match the operation of a client device or another cloned client device. For example, a first segment of the covert data field may contain the first power on time of a client device in microseconds. After a certain time period or number of events, a second segment of the covert data field may add a subsequent power on time for the device to the first power on time (e.g. T1,

T2). Even though the server does not know whether the second power on time was added by the client device or a cloned client device, the original power on time T1 is extremely unlikely to be identical for both devices, and the second and subsequent covert data items added to the covert data exchanged between client and server are designed to be unique between clients, and because additional covert data items are generated during the continued operation of the client the likelihood of the covert data being identical is very low.

**[47]** The server receives messages from authentic and/ or cloned client devices and saves the most recent covert identifiers associated with client credentials of the authorized user in server covert data storage module 23. When a subsequent message is received which is apparently from a device associated with the same client credentials, the server compares the covert identifier with the previously stored covert identifier for that client. If no match is found in one or more of the covert identifiers, one of the devices communicating with the server is likely to be a clone device, and the server reports to an operator that a clone has been detected. The operator can then initiate procedures to determine which device is a valid or authorized client device and which device is a clone.

**[48]** Figure 4 is a flow diagram illustrating one embodiment of a method of using the system of Figures 1, 2B and 3 for detecting the presence of cloned client devices on a network. In step 40, a client device sends a message to the server containing a covert identifier in covert data field 18. The message may be of the format illustrated in Figure 2B, for example, or may be any other type of standard network communication message with a covert identifier comprising one or more covert data values inserted at a selected data field in the message, or an identifier which is a transformed version of one or more covert data values. The server receives the message and extracts the covert identifier from the message (42), and then compares the covert identifier with the stored covert identifier corresponding to the client credentials associated with the registered client device from which the message appears to originate (step 44). The server determines whether there is a match (step 45) based on the comparison, i.e. determines whether there is a match between any part of a stored covert identifier and the covert identifier in the message. If a match is found, the server sends a message reply when appropriate to the client device (step 48), stores the new covert identifier, and the desired service or transaction takes place. If a match is not found, i.e. there is no match between any part of the covert identifiers, the server generates a report to the operator indicating that a potential clone has been detected (step 46), and an optional flag may be set in memory. If the covert identifier is a multiple

digit code created by transforming cover data values, a match means that a received covert identifier is identical to a stored covert identifier. If the covert identifier is one or more covert data values based on ongoing events, the received covert identifier may match only part of the previously stored covert identifier, while it includes new covert data values added after the last message to the server. A match is still found if part of the received covert identifier matches the stored covert identifier, but a match is not found if there is no match in any part of the covert identifier.

**[49]** The server may continue communications with the device which sent the message when a potential clone is detected, since it has not yet been determined whether or not that device is a cloned client device, i.e. the server does not have sufficient information to determine which of two client devices communicating with the server is a clone. In a last step, service may be discontinued to a device which is found to be a clone, or to all devices, leaving the authorized subscriber to contact the service provider to arrange for their service to be continued.

**[50]** In one embodiment, covert data values on which the cover identifier is based may be generated by certain operational events at a client device. Some examples of possible covert data values generated by operational events are:

a) Number of times a client has performed a certain event such as requesting a key or initializing a session with a server, or performing an e-commerce transaction.

b) The number of prior items purchased by a subscriber.

c) The number of transient key updates received by a client.

d) The time of the last firmware update

e) The time of the last key request for the client

f) The time of the last message of a particular type, or the count of the number of times a certain message was received, or the delay between the current message and the prior message being received from the server.

g) The time when a certain type of message was received by the client

h) The time when a certain type of message was received from the client

i) A count of the number of times a certain type of data message or network packets was received with examples including video ECM (Entitlement Control Messages), count of different MPEG2 PID values, count of packets on a particular TCP IP port number, etc.

j) The time delay between a request message being sent to the network and the response being received back from the server.

k) The last time a multicast join was performed, or the value of the last multicast join.

l) The IP address provided by the Dynamic Host Configuration Protocol (DHCP) server when DHCP is used in the system.

m) The time remaining on a DHCP lease when DHCP is used in the system.

n) Values obtained from other network devices such as the ranging parameters for a cable modem or the signal strength of the network after 3 days of running a new client.

o) Data changing or a new message being generated after a certain period of times, for example the client device receiving a covert data value from the server that indicates to the client device in how many minutes the client device should contact the server.

p) The value of a client data parameter after a number of events such as the TV channel number when 57 channel changes occurred.

q) A new covert data value derived from a previously used covert data value processed with a function that creates the new covert data value.

r) A covert data value generated from data within a chip on the client device, or covert data value generated from processed or scaled data from a chip or hardware plug-in board or card or secure memory in the client device.

s) A covert data value such as a token or key received from the server that the client device retains and uses as part of a covert identifier containing one or more covert data values or items in subsequent messages with the server. Covert data received from the server can be transformed by the client device and the transformed version can be returned to the server as a covert identifier in subsequent messages. This allows the server to pass tokens or keys to the client in normal messages between the client and server as part of normal system message. The server supplied token used for client covert identifier can be sent in a separate message but the preferred message is to pass the covert data value from the server in a normal message.

t) Time of day when 12000th network packet was received.

**[51]** Some of the above listed values may additionally or alternatively be used as event triggers or event counters which trigger the updating or modification of covert identifiers contained in a messaging protocol between a client device and a server. For example, an operational event may trigger a counter which counts subsequent operational events, such as the number of channel changes at a client device, for example, and records a covert data value when the user has changed channels a predetermined number of times. The covert data value may be the time of day when the predetermined count is reached, or the time it took before the predetermined count was reached. Other types of operational events may be counted in the same way to provide an event trigger, such as number of messages of a

certain type sent or received by a client device, number of items purchased, or the like, or the number of events itself may be used directly as covert data values. Other possible event triggers may be the time when an operational event occurs, such as a firmware update. Such event triggers may be used to change a previous set of covert data values to a new set of covert data values based on different operational events, with the new covert data values then used to create the covert identifier. This makes it much more difficult for hackers to determine which particular operational events are used to generate the covert identifier.

**[52]** Covert data 18 may be built in a table. One embodiment of a possible covert data table is shown in Table 1 below. In the table shown below the covert data table is built using two covert data items or values. One covert data item is the time of day (TOD) when the latest broadcast key request (BKEY) message was made and the other is the number of transient key updates obtained by a client device such as a set top box (STB) or other client device. Other covert data items based on operational characteristics may be used in alternative embodiments, and more than two covert data items may be used for added security. Initially both values in Table 1 are 0, and the initial covert identifier may be 0, 0. Table 1 below is only an example of two data values that can be together in one version of a client software release. It is envisioned that other covert data values may be used to create a covert identifier and that different data values may be used between different software versions. For example, in this example the number of transient key updates is being used, but in another version of the software the time of day (TOD) of the last transient key update could be used, or the number of seconds between the first and second transient key updates could be used.

| Covert Data | Description |
|---|---|
| TOD of first BKEY request | Time Of Day that the first or nth Broadcast Key (BKEY) request was made by client device. Initially this is set to 0. |
| Number of Transient Key Updates | The number of times that the client device had its transient key updated. Initially this is set to 0. |

TABLE 1 – Covert Data Table

**[53]** Figures 5A and 5B illustrate a flow diagram of the method steps in one example of an embodiment for detecting clone devices using covert data as in Table 1 above. Table 2

below illustrates one possible example of covert data values stored at both the server and client device or cloned client device at various steps in Figures 5A and 5B, and Figures 6A to 6F illustrate messages generated at various stages in the example of Figures 5A and 5B. In Table 2 and Figure 5, the term "real client device" is used to designate the original or authentic client device associated with client device credentials registered at the server, while the term "cloned client device" designates a client device which is an exact copy of the real client device with the same credentials. In step 100 of Figure 5A, a real or authentic client device is installed and registered as associated with a subscriber to the services provided by server 10, which saves the credentials of the subscriber client device in data base 20. At the first power on of the client device 14 (step 101), the covert identifier is initialized (step 102) to a known starting value at both the server data base and client device data base. The covert identifier in this case comprises a set of covert data values as indicated in Table 2 below. In this example, at least one of the covert data values used in the covert identifier is time of day (TOD) at which a broadcast key (BKEY) request was made by the client device, although any other covert data values may be used in place of the BKEY request TOD or in addition to the TOD in other embodiments.

**[54]** The initial covert data values as stored in the server data base 20 before any BKEY request has been received are Acknowledged (Acked) TOD= 0, Not Acknowledged (NotAcked) TOD = 0, i.e. covert data or identifier for this client at the server is 0, 0, while the initial covert data value stored at the client device when it first powers on is TOD=0. Since this is the first power application after the client device was installed, the TOD event trigger for the broadcast key request is zero, because the client device has not yet requested broadcast keys. Any or all covert data can be set at an initial state such as zero on the first power up of a client device and/or at the server prior to receipt of a first message from a client device. In alternative embodiments, one or more non-zero covert data values may be generated during the registration process when a subscriber's client device is registered at the server, and used to create an initial covert identifier, or included in a covert identifier in addition to one or more covert data values which are initially set to zero.

**[55]** In Table 2, the not acknowledged (NotAcked) value of a covert data item stored at the server is the last value issued to a client device (real or cloned) by a server which has not yet been acknowledged in a message from the client device. The NotAcked value is moved to the acknowledged (Acked) column of the value stored at the server when the client returns the NotAcked value or a value derived by the client device from the

NotAcked value. The client may return the NotAcked value in the next message to the server in one embodiment, as illustrated in Table 2 and Figures 5 and 6. In an alternative embodiment (not illustrated), the client device sends a specific acknowledgement message to the server on receipt of the new NotAcked value, confirming that the NotAcked value has been successfully stored in the client device data base. At this point, the NotAcked value replaces the Acked value at the server. However, this alternative is more susceptible to hackers obtaining the covert data value. The method illustrated in Figures 5A and 5B, in which the only acknowledgement of the NotAcked value occurs when the next message of a designated type is sent to the server, is more covert.

**[56]** After initializing, the client device 14 sends a request for broadcast keys (BKEY request) to the server in step 104. In one embodiment, this request contains a covert identifier or covert security data 18. The covert identifier in the BKEY message in this case is as follows:

TOD Last BKEY request = 0

Transient key updates = 0.

In other words, the covert identifier in the BKEY request is 0, 0, and the format of this message M1 is illustrated in Figure 6A.

**[57]** The server receives the BKEY request (step 105), and extracts the covert data values in the covert identifier from the request, then checks these values against the corresponding values stored at the server. This comparison is described below for the BKEY TOD covert data value only in a series of messages, but a similar comparison is carried out for other covert data values in a covert identifier, such as a value based on transient key updates. Since this is the first message from any client device using these client credentials, the BKEY TOD data matches (step 108), and the server returns the BKEYs to the client device (step 110) with a TOD value T1 determined by the server, i.e. the time of day of receipt at the server of the first BKEY request from this client. One embodiment of the format of the BKEY reply message R1 is illustrated in Figure 6B, in which the new TOD value T1 is provided in a message field after the message ID and SN. In an alternative embodiment, the TOD value for the message may be read by the client device locally, instead of being received in the message from the server. The TOD value received from the server may be replaced with any type of data value or token sent from the server in other alternative embodiments.

**[58]** In the example provided in Table 2 below, the TOD value T1 is 8437, and is added to the server data base as a NotAcked TOD in step 114 since no acknowledgement of

receipt of this value has yet been received from the client device. As noted above, the client device may be programmed to send an acknowledgement of receipt of the TOD value T1 in an alternative embodiment, but in this embodiment no such acknowledgement is sent until the next BKEY message, so the TOD value T1 remains a NotAcked value until and unless it is acknowledged in a subsequent BKEY message, which is a more covert option. At this point, the TOD values in the client identifier saved at the server are Acked TOD = 0, NotAcked TOD = T1 or 8437 in this example.

TABLE 2 – Example of covert data values at various steps in Figure 5

| Step | Server Actions | Server DB | Covert data values in client | Client/Clone Device Actions |
|---|---|---|---|---|
| 101, 102 | The initial covert data values for a client device are initialed to a known starting value. | AckedTOD= 0<br>NotAcked<br>TOD= 0 | TOD= 0 | All covert data at an initial state (0,0) |
| 112, 114 | Server returns BKEYs with a Time Of Day (TOD) value determined by the server. Server adds latest covert data value(s) to the server DB as unacknowledged value(s). DB contains last known good value (0 in this example) plus last unacknowledged value (current TOD = 8437) | AckedTOD= 0<br>NotAcked<br>TOD= 8437.<br><br>Note 8437 is a new TOD supplied by the server to the client. | | |
| 115, 116 | | | TOD now equals 8437. | Real client device saves TOD of last BKEY passed from server in BKEY delivery |

| Step | Server Actions | Server DB | Covert data values in client | Client/Clone Device Actions |
|---|---|---|---|---|
| | | | | message in non-volatile memory |
| 122 | | AckedTOD= 0<br>NotAcked<br>TOD= 8437 | TOD= 0 | Cloned client device covert data in BKEY Request is as follows: TOD Last BKEY request = 0, Transient key updates =0 |
| 126, 130 | Server returns BKEYs with a new Time Of Day (TOD) value determined by the server. Server adds latest covert data value(s) to the server DB as unacknowledged value(s). DB contains last known good value (0 in this example) plus last unacknowledged value (current TOD) | AckedTOD= 0<br>NotAcked<br>TOD= 9902.<br><br>Note 9902 is a new TOD supplied by the server to the client, eliminating the non-Acked value of 8437 sent to the other STB requesting keys before the cloned STB | | |
| 132 | | | TOD in clone is 9902. | Cloned client device saves TOD received from server in BKEY delivery message. |
| 134 | | ACKed TOD = 0, notAcked TOD = | TOD in Real client device is 8437 | Real client sends renew BKEY |

| Step | Server Actions | Server DB | Covert data values in client | Client/Clone Device Actions |
|---|---|---|---|---|
| | | 9902 | | message to server with Acked TOD of last BKEY request = 8437, and Transient Key Updates = 0 |
| 135 | Server receives BKEY request and checks TOD in DB against TOD in request. | ACKed TOD = 0, notAcked TOD = 9902 | Acked TOD = 8437 | |
| 140, 142 | Server updates notAcked TOD to 11305 and sends BKEYs and TOD to STB | ACKed TOD=0 notAcked TOD=11305 | TOD in real client device is 11305 | |

**[59]** In step 115, the real client device receives the broadcast keys in the reply from the server, along with the new TOD value T1 (in this example 8437). The client device then stores the new TOD value (step 116), and decrypts encrypted data such as broadcast data from the server using the broadcast keys (step 118). In the illustrated example, a cloned client device powers up (120) sometime after the first broadcast keys are received by the real client device and before the real client device sends a subsequent broadcast key request to the server. This sequence of events does not happen in all cases, and is only one possible example of a sequence of real and cloned client device communications with the server. The cloned client device sends a broadcast key request to the server (122) containing a covert identifier comprising initial covert data values 0, 0, and a possible format of this message M2 is illustrated in Figure 6C. The first message from any cloned client device in this embodiment contains the same covert identifier as the first message from the authentic or real client device, i.e. 0, 0. If this message is received by the server before the real client device has acknowledged a new TOD value from the server, the server still has no way of knowing that there is a cloned client device. If it is received after a new TOD value has been acknowledged by the same client device which initially requested BKEYs, the server knows that there are two client devices on the system using identical credentials, and generates a clone detection report as in Figure 4.

**[60]** In the example of Figures 5A and 5B, a cloned client device sends the first BKEY request to the server before the real client device has acknowledged receipt of a new TOD value from the server. On receipt of the BKEY request, the server extracts the covert data values 0, 0 and compares these values with the covert data values stored for the real client device having the same credentials (step 124). At this point, a covert data match is found (step 125), i.e. the received covert data is correct, since no specific acknowledgement of receipt of the Not Acked TOD T1 (e.g. 8437) has yet been received from the client device. In this particular example, the server does not know if the message containing the TOD was never received by the client device for some reason, such as network failure or the client device being turned off, and therefore does not assume that there is any cloned device present. The server data base contains the last known good value of the TOD (in this case 0) plus the last unacknowledged TOD value T1. Since the acknowledged value is a match, the server sends the broadcast keys to the cloned client device with a new TOD value T2 (step 126) in a reply message which may have the format illustrated in Figure 6D in one embodiment. In the particular example provided in Table 2 above, the value T2 is 9902. At the same time, the NotAcked TOD at the server is changed to T2 (or 9902 in this example) in step 30, as illustrated in Figure 5B, eliminating the previously stored NotAcked TOD T1 (or 8437 in the example of Table 2).

**[61]** The cloned client receives the BKEY message and new TOD value T2 in the message from the server and saves the new TOD value T2 (step 132), and proceeds to decrypt data such as broadcast data received from the server (step 133). In the example illustrated in Figure 5B, the next communication with the server after step 132 is a message sent from the real client device requesting broadcast keys (BKEY Request) since the real client device needs to renew its BKEYS (step 134). This message may have the format illustrated in Figure 6E and contains a covert identifier comprising the covert data values currently stored at the real client device, specifically the TOD of the last BKEY request from this client device (T1 or 8437) and the transient key update number (0 in this example). In step 135, the server receives the new BKEY message from the real client device and compares the current stored Acked and NotAcked TOD values (specifically 0 and T2 or 9902) with the TOD value T1 or 8437 received in the covert identifier from the client device. Since the value T1 received from the client device is not equal to either the Acked value 0 stored at the server, or the NotAcked value T2 stored at the server (step 136), the server reports clone detection to the system operator for further action (step 138). Other server side processing can be applied at this point to detect clones. The server does

not deny service since it cannot determine which of the two client devices sending messages is the real or authentic client device, and therefore sends BKEYs and a new TOD value T3 (11305 in the example of Table 2 above) to the real client device (step 140) in a reply message which may have the format illustrated in Figure 6F. The server then stores the new TOD value T3 as a NotAcked value in the server data base (step 142), and the real client device also stores the new TOD T3.

[62] The method of Figures 5A and 5B illustrates one possible method and sequence of events in which a cloned client device sends a message to a server after the real client device has received its first BKEYs from the server but before the real client device requests renewed BKEYs from the server. Such events may occur in different sequences depending on usage of true and cloned client devices, and more than two client devices with the same credentials may send messages to a server during the same time period. Cloned client devices may send messages to the server at any time and in any order relative to similar messages sent from a real client device. Regardless of the order, the server can determine the presence of a cloned client device because the covert data values in messages from either the real client device or one or more cloned client devices do not match one or more currently stored values at the server. For example, referring to Figure 5A and step 122 of Table 2, if the real client device sends a subsequent BKEY request to the server at this stage, before any message is sent by a cloned client device, then the covert data values in the BKEY request are T1, 0 or 8437, 0 in the specific example of Table 2. The server receiving this message notes the match between the TOD value from the client device and the notAcked TOD saved in its data base, and changes the Acked TOD from 0 to T1. A new notAcked TOD T2 is then sent in the reply to the client device. A cloned client device subsequently communicating with the server sends a TOD =0, since it is the first communication from that device to the server. This TOD does not match either the Acked TOD (T1) or the Not Acked TOD (T2) stored at the server, and a clone detection report is generated by the server. A similar failure to match occurs at some point in any message sequence when more than one client device using the same credentials is communicating with a server, regardless of the order of communications between a server and a real client device and cloned client devices.

[63] In the embodiment of Figures 5 and 6, and the specific example of this embodiment outlined in Table 2 above, the covert identifier in each message comprises two or more covert data values. However, the covert identifier may comprise a code generated based on such covert data values, for example by transforming the values using

a hash function or the like. The message containing the covert identifier is a broadcast key request in the above embodiment, and the client device receives a broadcast from the server. The client device in this case is a media player such as a television set top box, personal computer, or any other client device capable of playing a broadcast such as television broadcast. The server may be one that distributes broadcast television channel decryption keys to clients. However, other types of client device and service providers can use the same covert data techniques in different types of messages. As noted above, covert data techniques of the above embodiments can be applied to any type of network service provider and to any type of client device linked to servers of the service provider, such as personal computers, cellular phones, personal digital assistants (PDAs), video equipment (TIVO, DVD, CD, etc.), and any other type of client device, and for any type of service such as on-line banking, e-commerce, data logging, message communications systems, etc. In the above embodiment, broadcast television channel decryption keys (BKEYS) are the keys necessary to decrypt encrypted broadcast TV channels as is typically used for premium televisions channels such as Home Box Office (HBO) or the Movie Channel. Premium television channels are optional channels that a cable TV or internet protocol (IP) TV subscriber may elect to purchase. The techniques described herein are also applicable to any encryption techniques where keys are distributed to client devices to allow access to various types of network services, or can be used in different types of messages between a server and a client device in addition to, or instead of, decryption key request messages.

**[64]** Because there is the possibility that a real client device does not receive a message from a server due to network failure or due to the client device being turned off before the message response is received, the embodiment of Figures 5A and 5B may include server side processing to reduce the number of false clone detection alerts generated, whereby a clone detection alert is an indication that a client has been detected with client credentials identical to another client. In one alternative embodiment, as mentioned above, an explicate client acknowledgement is sent from the client device each time a covert data item used in a covert identifier is updated, and the server coordinates the expected covert data item in the server database based on the acknowledgement from the client that a server supplied covert data item was successfully received and stored by the client. The use of a direct acknowledgement message between the client and server indicating that a covert data token from the server has been stored by the client, or that the client covert data item has been acknowledged by the server can improve the detection of clones but

creates additional messages that are processed by the server and can be intercepted by hackers.

**[65]** In one embodiment, the server sends unique covert data items or tokens to a client device for use in subsequent messages. Examples of data items or values that the server may send to the client device include temporary data values periodically changed by the server when the client and server communicate, temporary keys sent from client to server, and the like. In one embodiment, the server sends temporary or transient encryption/decryption keys to a client and the transient keys becomes part of the key ring used in encrypting messages between the client and server. The use of transient keys prevents cloned clients from communicating with the server because only one client contains the appropriate keys to achieve encrypted communications between a client and a server. The transient keys may be sent over a session base encrypted communications channel such as provided by SSL or provided by Diffie Hellman type key exchanges so network packets containing the updated transient keys supplied by the server cannot be decrypted by cloned devices obtaining the same transient key update messages. Such session based encryption may be used for any type of communications. In one embodiment, the server sends a token or tokens to the client device, which are stored by the client device and used in subsequent client-to-server messages. The server may provide a unique token at random times or at fixed intervals to a client device.

**[66]** In the example of Table 2, two covert data values are shown. However, one, two or more covert data values may used with values that are uniquely provided by the server and/or values that are uniquely determined by the client based on operation of the client device. In one embodiment, covert data module 29 at the client device may include non-volatile memory, and parts or all of the covert data may be stored locally in the non-volatile memory (hard disk, Flash memory, or the like) on the client device. The power-on order of real and cloned client devices or the order in which they connect to a network, or the order they make a first connection with the server, is not important and the techniques described above do not require the client devices to power up in any order. Thus, the first client device to power up in Figures 5A and 5B may be a cloned client device rather than a real client device, and real and cloned client devices may communicate with the server in any order and at any times. Regardless of the message order, this embodiment enables the server to determine when there is more than one client device using the same client credentials when a message is received in which the covert

data value does not match a covert data value at the server, indicating that a real client device has been cloned.

[67] Figures 5A and 5B illustrates covert clone detection using a single covert data item being sent from the server to a client device in the form of the Time of Day (TOD) of the last request from a client device. In an alternative embodiment, one or more covert triggers may be used. A covert trigger is a trigger that takes place after a number of events occur and which responds by modifying the covert data used to create the covert identifier, or providing a new piece of covert data that can be tracked by the server. There are numerous possible covert triggers in the normal operation of a client device, and covert triggers or events can be based on multiple categories of events such as time (total number of hours client device has been active, random number of hours after client device was installed or updated, or the like), messages (total number of video entitlement control messages or ECMs received, total channel changes), or internal data processing (e.g. TOD when the 100,000th video packet was decrypted). Other examples of a covert trigger include a trigger that occurs when a client device such as a set top box (STB) has switched channels 100 or 200 times, for example, or a trigger that occurs when a certain number of client events occur and the trigger saves the client time of day (or other parameter) when the trigger occurs. Another example is the actual value of the 15000th ECM packet received, or the Time Of Day (TOD) when the 15000$^{th}$ ECM packet was received or a hash of the two data values. Events which trigger creation of a covert data value occur at different rates in two client devices with identical credentials (authentic/real and cloned client devices), so that the authentic or real client device and cloned client devices have different covert data and therefore different covert identifiers. The covert identifiers are used on the server side to detect multiple clients running on a network.

[68] In one embodiment, client libraries of saved covert values are periodically changed to save new or different covert data values which in turn are used to generate a covert identifier. In this way, hackers who may have obtained one client library do not know when a new event which creates a covert data value used in a covert identifier might occur after a client library has been updated. Hackers need to take all the cloned client devices off the network to avoid detection after a client library software update, in order to try to determine what covert triggers are programmed into the client library, when the triggers occur, and what covert data is stored in the client library in response to a trigger. Such updates may be generated by a server and may use secure processing capabilities contained within the client device. The client firmware download method for updating the

client library may used digitally signed code images to allow the client to authenticate the download. The head-end software may have application programming interface (API) functions or a data carousel interface for downloading client software.

[69] In one embodiment, covert identifiers contain data that may be static for a number of requests and then the covert data used to generate the covert identifier changes based on a covert trigger, or the covert identifier for every message of a certain type changes, such as the Time of Day or TOD for the prior message request. Covert data used in a covert identifier can originate within the client device, or be sent from the server as part of the messaging, or may be a combination of client/server data. The covert identifier can include data that is processed by the client or server such as applying current covert data values to a mathematical transform or cryptographic hash.

[70] In one embodiment, covert data values used in a covert identifier may also change based on the server responding to a request in one of a number of different ways. In one example, the first 10 broadcast key requests receive one value of covert data and subsequent requests beyond 10 receive a different response in which the covert data is changed or scrambled or both. Changes can occur on client or server side or both. The covert identifier is contained in a message blob or field as part of a normal message processed during normal system processing and the message blob may vary between two different code releases of the client software. In addition, the message blob may have meaningless random data applied as a data whitener. In one embodiment, the data blob has three to five covert data values and the covert data values change based on different events or triggers occurring at different times.

[71] In the embodiment described above in connection with Figures 5 and 6, a covert identifier based on time of day of a message is provided in broadcast key request messages or the like. Table 3 below illustrates an example of a transformed covert identifier created in client devices comprising mobile phones.

Table 3 – Mobile phone covert identifiers

| | Real Phone | | | Clone 1 | | | Clone 2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Mobile ID (ESN) | 100-4452 | | | 100-4452 | | | 100-4452 | | |
| Call log | # | TOD | Dur. | # | TOD | Dur. | # | TOD | Dur. |
| | N1 | 8:22 | 1:06 | N3 | 23:45 | 7:45 | N5 | 16:41 | 3:16 |
| | N2 | 9:11 | 0:23 | N4 | 1:02 | 3:36 | N6 | 21:42 | 10:44 |
| Covert identifier | 391740 | | | 457492 | | | 112208 | | |

[72] In Table 3, one phone is real and the other two are clones, and each phone creates a covert identifier based on the operation of the phone. In the example above only the first two call entries are used to generate a unique covert identifier (ID). The call log of each phone is processed with a cryptographic hashing type function that generates a unique covert ID for each phone, resulting in an identifier that is unique to each phone even for perfectly cloned phones. Because the phones were cloned at manufacturing and each phone is used slightly differently over time, the covert identifiers are extremely difficult to duplicate, even if the owners of the phones tried to create identical call logs to generate identical covert identifiers. This is because it would be necessary to obtain micro-second identical events in order to create perfectly identical call logs, which may be impossible in real world devices.

[73] The covert identifiers between client and server may be encrypted for added security, with the encryption keys being unique between clients, but the covert identifiers may be non-encrypted covert data values in other embodiments. In some embodiments, key-less security between a client and server may be involved, using only the covert data values or covert identifiers based on such values to identify client devices. However, the security is enhanced when the client/server communications are encrypted. Covert data or covert identifiers may be used in many ways to operationally identify a client without the need for a pair of encryption keys. In fact, the covert data scheme described above can be used in all message transactions without security specific messages being required in a system. This means that the covert data techniques described herein can be used to enhance the authentication of clients with and without security credentials such as X.509 certificates, encryption keys, and similar security specific keys. In one embodiment, all communications between a client and a server or between two computer devices are enhanced by the techniques described herein in situations where an encryption specific key is not required. Embodiments can apply to all types of software and firmware running in a system including application software, system middleware, billing software, any type of e-commerce transaction, any type of client/server communications, and any type of messaging between a client and a server or where a client needs to be identified.

[74] In one embodiment, covert security data may be used to provide key-less security in systems which do not use security or encryption for communications between client devices and web sites or servers, as well as allowing for cloned client device detection. This embodiment is illustrated in the flow diagram of Figure 7. In a first step 150, a client

device contacts a web site or server to register for service. During registration, the client device sends an initial covert identifier to the server that uniquely identifies the client device (step 152). The covert identifier in this embodiment comprises a series of covert data values, but may comprise a transformed version of such values in other embodiments. The initial covert data values used in the covert identifier can be any client device specific data, including the covert data described herein, which is difficult to clone. When registering, the client can send somewhat difficult to clone client information as the covert identifier, such as central processing unit (CPU) serial number if available, disk drive volume ID, or other hardware specific information. The registration process itself may create new covert data values at the server side or client side which is more difficult to clone, such as data from one or more registers in the CPU or computer hardware devices, the time delay in nano-seconds between a message sent and the response being received by the client, check sum or crc values of a portion of memory, and the like. The initial set or table of covert data is captured and stored by the client device and server during the registration process (step 154). At this point, the covert data is unique to the registered client device, and client-server communications proceed using the covert identifier based on this data to validate the client device (step 155). In this case, the method for detecting cloned client devices is as illustrated in Figure 4. If the server receives a communication which purports to be from the registered client device but does not have covert data values matching the initial covert data values stored at the server for that client device, a cloned device detection report is generated by the server.

**[75]** Since hackers may be able to hack into the system and obtain the initial set of covert data values, or the covert identifier based on that data where it is transformed, new covert data is created based on operational characteristics as the client device continues to run (step 156). The new covert data is added to the initial set of covert data values in subsequent communications between the server and client device (step 158), with the new covert data values added to the previously stored covert data values for that client device (step 160) at both the server and client device. The new covert data may be created via timed events or counted events adding additional covert data created after registration to identify the client. Optionally, the server can create and deliver covert data to the client device at various times during the message providing the client device with additional covert data that is unique for this client device. New covert data continues to be added as the client device continues to run, so that there is no static set of covert data used for any extended period of time, making hacking and cloning much more difficult. At any stage, if

the covert data received in a message from a purported real client device does not match the current set of covert data stored for that client device at the server, a clone detection report is generated.

[76] The method of Figure 7 allows systems without security to create client unique identifiers based on covert data which cannot easily be hacked. For certain applications, the covert data techniques alone may provide adequate security, or the covert data techniques may be added to systems where the client/server messaging is secured using best-of-breed encryptions techniques enhanced with the covert data methods described herein, for example as described in connection with Figures 5 and 6 and in Table 2.

[77] The covert data techniques described above may be used to enhance security when encryption keys are also used to encrypt messages between computer devices or keys are used to securely identify computers on a network. When a cloned client device is created, the cloned device has the identical keys of an authorized, authentic or real client device and can decrypt all messages being sent between the authorized authentic real client device and the server. However, operationally the real client device and the cloned client device perform certain functions differently over time, or have different operational counter values (number of ECM processed, time of day when 10th channel change occurred, and the like), so that the covert data generated by the real client device and the cloned client device differs, as explained above.

[78] In many cases the actual value of the covert data is not important but what is important is that the operational behavior of a client device such as a set top box is different under normal operating conditions when compared to a cloned copy of the authentic client device. This means that that covert data values differ from client-to-client even when client devices have cloned client credentials identical to the real client device. In some embodiments, these operational differences are used to detect covert data values or covert identifiers based on such values that differ between an authentic client device and a cloned client device, and one embodiment of such a method is explained above in conjunction with Figures 5 and 6 and Table 2. In addition, the covert data values may be "counter values" which are weighted with a scaling factor requiring that the client device operate for a period of time before a value changes, thus providing data values that remain fixed at a single value for days, weeks, or months of operation. In one embodiment, one or more covert data values are utilized as a covert identifier in the messaging between client device and server. In one embodiment, more than one covert data value is used with different thresholds or triggers that result in the various covert data values changing at

different rates. Table 4 below shows an example of three covert data values or items in a message called "Get Key Message" and the changes in the covert data items over time.

**[79]** The embodiment of Figures 5A and 5B and Table 2 used a Broadcast Key or BKEY request for sending covert data values, and the same techniques described below in Table 4 for the Get Key Message can be used on the Broadcast Key or BKEY request example or any other messages used between a client device and server. Also note that the covert data items or values can originate on either the client device, or the server, or both and that covert data values can be the results obtained by processing a data value such as by using a hash function, or seeding a random number value or performing a transform on the data value used as part of the covert data scheme.

TABLE 4 - Get Key Message (GKM) and Covert Data over time

| Message Fields | GKM Message after Power on reset | GKM Message after 2 days | GKM Message after Counter 1 trigger | GKM Message after 1 week | GKM Message after 9 days | GKM Message after 2 weeks | GKM Msg after 3 weeks |
|---|---|---|---|---|---|---|---|
| GKM Message ID | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Covert Data Item 1 | 0 | 0 | 0 | 0 | 0 | 31 | 31 |
| Covert Data Item 2 | 0 | 0 | 0 | 0 | 88359 | 88359 | 88359 |
| Covert Data Item 3 | 0 | 0 | 7190 | 7190 | SQR of 7190 | SQR of 7190 | SQR of 7190 |

**[80]** The above example in Table 4 shows how three covert data values or items 1, 2, 3 in a Get Key Message (GKM) change over time. The GKM Message ID shown in the

above table as a value of '1' identifies the message as being a Get Key Message. It is envisioned that, after each firmware revision, the covert identifier being sent as part of the client/server communications for a particular function such as a get key request (or any other event such as an e-commerce transaction or other transaction) contains different covert data items than the prior firmware release, making prior firmware hacks useless on the system. In the above example, the covert data items are different operational values generated at the client device or server, and may be any of the possible covert data items or values described above, or any other unique data derived from operation of a client device. If the server receives a GKM message at any time which does not match the current GKM message stored for the particular client device, it generates a cloned client device detection report.

**[81]** In the above example, the Message ID for the Get Key Message does not need to change and is considered a static Message ID value to indicate one of a number of message types for communications between the client and server. However, the Message IDs can change between different client firmware versions, forcing would be hackers to have to reverse engineer the new Message IDs when a client firmware update is achieved. A firmware revision number may be contained in the message ID to allow the server to work with different client firmware versions.

**[82]** In one embodiment, the covert data items gathered for various firmware releases differs between the different versions. Table 5 below shows an embodiment of possible covert data fields for three different firmware releases. This table shows the contents of three covert data fields for three different firmware releases named release 1.0, 1.1, and 1.2, with the various releases occurring over a period of one year, for example. The covert identifiers in messages between client device and server, or server and client device, or both, consist of three covert data items, with the nature of the covert data items being dependent on the current firmware release used. The table is read by reading down each column. The three covert data items for release 1.0 of the firmware are the 4th message token from the server, the scaled ECM packet count, and the time of day for the third message of a particular type received. In release 1.1, these items change to a scaled count of the total number of hours the client device has been running, a token received from the server after the $6^{th}$ message of a particular type with the server, and the time of day when the $10{,}000^{th}$ message of a particular type was received by the client device. In release 1.2, all three covert data items are again changed, with covert data item 2 changed to zero, and the other covert data items changed to time of day when the $150^{th}$ message of a particular

type was received, and the value of the channel number that the client device was tuned to at 8:37 pm on the day the new firmware was installed.

TABLE 5 - Example of covert data values in different firmware releases

| Covert Data Item number in message | Value of covert data in release 1.0 | Value of covert data in release 1.1 | Value of covert data in release 1.2 |
|---|---|---|---|
| 1 | Token received from server after 4th message with server | Scaled count of the total number of hours client device has been running | Time of day when the 150th message of a particular type was received |
| 2 | Scaled count of ECM packets received | Token received from server after 6th message with server | Always set to 0 and never changes |
| 3 | Time of day when 3rd message of a particular type was received | Time of day when the 10,000th message of a particular type was received | The value of the channel number that the client was tuned to at 8:37pm |

**[83]** In one embodiment the covert data item or items used for any single firmware release can also change at predetermined times or in response to predetermined triggers. For example, say that a certain revision of code is released in the month of March and loaded onto the client device. For the first two months after the revision is loaded, covert data item 2 is the time of day the firmware was updated. Then, after two more months, covert data item 2 changes to a data value provided by the server. Then, after four months of operation of this firmware release, the data item 2 changes to the register value contained in a chip on the client device at the four month anniversary of loading the revision. In this embodiment, the value of a covert data item changed three times during the first four months of operation, so that hackers have more difficulty in successfully running clones of the client device. When the value of pre-stored covert data items change at a particular epoch, the server is aware of the epoch and adjusts its database appropriately. For example, say that after 90 days of operation the client library is designed to generate an entirely new covert data table or matrix, then the server is aware

that after 90 days of use the client is reporting new covert data. In fact, even synchronizing the clones to flush their old covert data tables and refresh to new data at the same time presents hackers with logistical problems, especially when the hacker may not be expecting the covert data values to be changed.

**[84]** There are many different possible covert data items and covert data triggers generated by the client device operation, the server communicating with the client device, or both, which may be used to generate client identifiers added to messages in the embodiments described above. One or more covert data items may be a token or a time provided by the server to the client device as part of the message response and the server provided data item is returned back to the server by the client device at a later time (maybe at the next request by a client device), for example as described above in connection with Figures 5 and 6 and Table 2. This allows the server to generate tokens used as covert data to identify clones. Covert data can also be a count of the number of messages processed by a client device or the number of messages written to a message log or message queue by the client device, or the value of the 10th API call to a client API function, or other similar event that would normally vary between client devices even with identical credentials.

**[85]** In many cases the client device may not know or even care what the meaning of the covert data is, because it is information used on the server side to detect clones, or it was information provided by the server to detect clones. In one embodiment, some covert data values are generated based on one-time events such as what channel was the client device tuned to after a particular time period of operation of a new client device, e.g. 23:49:33 (hours:minute:seconds) of operation. Other covert data values may be generated using network or system operational values such as cable modem ranging parameters, DHCP lease times, and the like. Still other covert data values may be supplied by the server. Other covert data values may result from the messaging between a client device and a server, or other parameters normally found in the environment for the product. For examples, PCs can have different covert data values than wireless phones.

**[86]** A security system using covert data generated by client device operational events as described in the above embodiments may also be designed to include a subscriber entitlement renewal process, either when cloned or pirated client devices are detected by the system or suspected for other reasons, or at predetermined intervals regardless of suspected cloned client devices. Figure 8 illustrates an embodiment of the renewal process for a two way network or a one way network with a return channel. Any form of persistent or non-persistent (sporadically available) return channel such as an occasional dial-up

modem connection or a return channel formed when a cellular phone is connected to a client device such as a STB can be used for renewal as in Figure 8. A similar process may also be used on a one way network without a return channel, and one embodiment of such a process is illustrated in the flow diagram of Figure 9.

**[87]** The process of Figure 8 may be used in a renewal process in connection with two way networks or a one way network with a return channel. As illustrated in Figure 8, a request for covert identifier is sent by a server over a network to individual clients (on 2 way networks) or all client devices (on one way network). Server sends a Renewal Message to Client (181). Assuming that a return channel is available (182), the client devices are programmed to respond by sending the current covert identifier back to the server (step 184). If a return channel is not available (i.e. the client device is operating on a one way network with no return channel), the procedure continues as illustrated in Figure 9 and described in more detail below.

**[88]** The covert data identifier sent back in step 184 for networks having a return channel is based on the covert data collected by a particular client device, which in turn is related to operational events at that client device. Since the covert identifier has just been updated in each client device, hackers have to re-start their hacking to find the covert identifier of the real client device immediately after receiving the update code in step 179, and attempt to duplicate that covert identifier in any clone device. Such hacking attempts are unlikely to be successful in time for the covert identifier to be duplicated before the response containing the covert identifier for each client device is sent back automatically from each client device in step 184. In one embodiment, the covert data identifier is an eight digit code generated from collected covert data values, and contains no subscriber related behavioral information or privacy related information. However, other codes based on covert data values may be generated in alternative embodiments. The server then determines whether more than one response has been received with the same client identifier but different covert data (step 185). If only one response is received, a renewal unlock code based on the covert identifier received from the client device is created by the server (step 186) and transmitted to the client device (step 188). If only one response is received, there are most likely no clones of the real client device on the network, and the real client device unlocks the renewal code and is renewed for service. However, if the real client device did not send a response for some reason, or cloned client devices did not send a response, more than one client device may still receive the renewal unlock code, since this code is broadcast to all client devices operating under the same client identifier

or credentials. Only the client device with the same covert data identifier is able to unlock the renewal code and be renewed for services through the network. Any other client devices using the same client identifier are not be able to unlock the renewal code, and are blocked from receiving services. If the renewed client device is actually a clone, the real subscriber is blocked and calls the service provider to complain. In this case, the cloned device is blocked and the service with the real subscriber's client device is renewed. An optional step not shown in Figure 8 and before step 181 would be to send a covert identifier update message to the client to have the client at that moment obtain yet another new covert data value and add it to the covert data table being returned in step 184. Each client device receiving the message then updates the covert identifier based on current operating characteristics of the particular device for the particular piece of covert data being captured.

**[89]** If more than one client device response with a covert identifier has been received at step 185, the real client device is identified (step 189). Identification of the real client device at step 189 may comprise a network user authentication method as described in co-pending Application Serial No. 11/489,779 filed on July 20, 2006, the contents of which are incorporated herein by reference. In this method, authorized subscribers are associated with the location of physical connections to the client device, and the network is probed in step 189 to determine which client device is at the correct physical network location for the authorized subscriber. When the correct or real client device is located, a renewal unlock code based on the covert data received from that client device is created in step 190, and is broadcast over the network in step 192 to all client devices having the same client on one-way networks and delivered uniquely to clients on two-way networks. Services are blocked to all such client devices, and only the real client device can unlock the renewal code and renew services.

**[90]** If the service provider does not have authentication procedures based on physical location or physical connection identifiers for real client devices, the real client device may be located by other techniques, such as having a service operator call the subscriber and having the subscriber look up the covert identifier on the real client device and provide that identifier to the service provider in an SMS message or over the phone.

**[91]** Figure 9 illustrates steps in a periodic renewal process which may be used in connection with a covert data security system for client devices on one way networks having no return channel. This renewal process uses the same initial steps 179, 180 and 181 as illustrated in Figure 8. However, in response to the service code renewal message,

the central processor at the client device is programmed to display a service code or renewal message on the screen of the client device (step 193). This message includes the client identifier and the current covert identifier retrieved from the covert data storage module 29. The client identifier for the client device is identical for real client devices and cloned client devices, but the current covert identifier stored at the client device is different for each client device. The service code message includes a request that the user sends the two IDs to a telephone number displayed on the screen, which may be an 800 number for the service provider.

**[92]** In step 194, the user of the client device provides the client identifier and covert data ID to the service provider as an SMS message to the telephone number on the screen, or alternatively via a voice telephone call to an operator at the service provider. At this stage, the service provider may be able to determine whether the sender of the message or the caller is the authorized subscriber, based on personal information or security information stored at the server, such as the telephone number of the authorized subscriber. If it is determined that the caller is the authorized subscriber, the server or service provider generates a renewal unlock code based on the unique covert data ID received from the user in step 195, and sends or broadcasts the renewal unlock code to all client devices on the network with the same client identifier (step 196). If the client device receiving the code is able to correctly process the unlock code (step 197), service is renewed for that device (198). If a client device receiving the code is unable to correctly process the unlock code, because the covert data stored at that client device does not match the covert data in the unlock code, service to that client device is blocked (step 199). If the system has incorrectly determined that a caller or sender of the requested message is the authorized subscriber, and the user is actually using a cloned device, so that the real client device is unable to process the renewal unlock code, the authorized user calls the service provider because their service has been blocked. A further renewal unlock code can then be generated based on the covert data at the real client device and broadcast to client devices so that the previously renewed device is blocked and the real client device is renewed for service.

**[93]** The renewal processes described above in connection with Figures 8 and 9 may occur at predetermined intervals or when presence of one or more cloned client devices on a network is suspected, or both. The renewal process as described in Figures 8 and 9 can use any part of the covert data tables or pieces of the covert data tables to generate client device specific unlock codes whereby cloned clients with different covert data values are

not be able to generate the appropriate keys to decrypt the unlock code. An example of such a client specific key management scheme is Diffie Hellman. Other types of key exchange mechanisms can be used. Using Diffie Hellman for example, covert data (any or all) is used as part of the seeding mechanism used to generate the client side unique key or part of the data used to provide server side compatible keys such that cloned clients with different covert data values are not able to generate the same unique keypair (Diffie Hellman keypair) between other cloned devices. Another way the renewal process can be achieved is by having the server use the covert data received for a client in a known way to seed or generate shared pairing keys in algorithms such as Diffie Hellman, and in essence, generating a unique key pair that can only be recreated by the client containing the appropriate covert data. Another optional method of performing client device renewal is to use part of the covert data as encryption/decryption key data because each client has unique covert data and the unique covert data is known to the server. Pieces or all of the covert data or hashed or transformed versions of the covert data can be applied to keys or seed data or factors used to generate encryption/decryption key data or used in generating shared keys with algorithms such as Diffie Hellman. It is also anticipated that the covert data can be used to scramble or transform key seed or key factor data being sent between the client and server, or server and client during the renewal process. For example, the covert data can be hashed by the client and then used as a key when encrypting data being sent to the server. And, because the server knows the covert data, the server can perform the same hash to generate the decryption key.

**[94]** Again, using Diffie Hellman as an example, a covert data base Key Exchange can work as follows:

1. Alice chooses a random large integer X and sends Bob
   X = (g^x mod n ) encrypted with Covert Data
2. Bob chooses a random large integer Y and sends Alice
   Y=(g^y mod n) encrypted with Covert Data
3. Alice decrypts Bob's encrypted Y and computes
   K = Y^x mod n
4. Bob decrypts Alice's encrypted X and computes
   K'=X^y mod n

Following Diffie Hellman both K and K' are equal and the covert data was used as an encryption key for transferring data. Covert data can be used in more ways than only

encryption key data and can be used as seed data for the random large integer calculations or hash applied to data and values used in algorithm calculations.

**[95]** In the above embodiments, a unique covert identifier is generated based on operational events occurring during operation or use of a client device, based on how the client or subscriber uses the client device. These operational events are different between real client devices and cloned client devices because cloned client devices are operated by their users differently from users of real client devices or other cloned client devices. Such operations are extremely difficult to duplicate. The covert identifier may be used to detect cloned client devices and also in a periodic renewal process which may eliminate service to cloned client devices.

**[96]** Those of skill will appreciate that the various illustrative logical blocks, modules, circuits, and algorithm steps described in connection with the embodiments disclosed herein can often be implemented as electronic hardware, computer software, or combinations of both. To clearly illustrate this interchangeability of hardware and software, various illustrative components, blocks, modules, circuits, and steps have been described above generally in terms of their functionality. Whether such functionality is implemented as hardware or software depends upon the particular application and design constraints imposed on the overall system. Skilled persons can implement the described functionality in varying ways for each particular application, but such implementation decisions should not be interpreted as causing a departure from the scope of the invention. In addition, the grouping of functions within a module, block or step is for ease of description. Specific functions or steps can be moved from one module or block without departing from the invention.

**[97]** The various illustrative logical blocks and modules described in connection with the embodiments disclosed herein can be implemented or performed with a general purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof designed to perform the functions described herein. A general-purpose processor can be a microprocessor, but in the alternative, the processor can be any processor, controller, microcontroller, or state machine. A processor can also be implemented as a combination of computing devices, for example, a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration.

[98] The steps of a method or algorithm described in connection with the embodiments disclosed herein can be embodied directly in hardware, in a software module executed by a processor, or in a combination of the two. A software module can reside in RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, hard disk, a removable disk, a CD-ROM, or any other form of storage medium. An exemplary storage medium can be coupled to the processor such that the processor can read information from, and write information to, the storage medium. In the alternative, the storage medium can be integral to the processor. The processor and the storage medium can reside in an ASIC.

[99] Various embodiments may also be implemented primarily in hardware using, for example, components such as application specific integrated circuits ("ASICs"), or field programmable gate arrays ("FPGAs"). Implementation of a hardware state machine capable of performing the functions described herein will also be apparent to those skilled in the relevant art. Various embodiments may also be implemented using a combination of both hardware and software.

[100] The above description of the disclosed embodiments is provided to enable any person skilled in the art to make or use the invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles described herein can be applied to other embodiments without departing from the spirit or scope of the invention. Thus, it is to be understood that the description and drawings presented herein represent a presently preferred embodiment of the invention and are therefore representative of the subject matter which is broadly contemplated by the present invention. It is further understood that the scope of the present invention fully encompasses other embodiments that may become obvious to those skilled in the art and that the scope of the present invention is accordingly limited by nothing other than the appended claims.

## Claims

1. A method of detecting cloned client devices communicating over a network, comprising:

storing at a server at least one covert identifier for a client device having credentials registered at a server;

receiving a message from a client device at the server, the message containing a covert identifier derived from at least one operational event of the client device;

determining whether the covert identifier received in the message matches a covert identifier for the client device having the same credentials stored at the server; and

reporting detection of a clone of a real client device if at least part of the covert identifier in the message does not match the covert identifier stored for the client device at the server.

2. The method of claim 1, wherein the covert identifier comprises selected covert data values generated by operational events at a client device, and detection of a clone of a real client device is reported if covert data values in a covert identifier received from a client device do not match any covert data values in a covert identifier stored at the server.

3. The method of claim 1, wherein the covert identifier comprises a code based on selected covert data values generated by different operational events at a client device.

4. The method of claim 1, wherein the covert identifier is at least partially based on at least one token provided by the server to the client device.

5. The method of claim 1, wherein the covert identifier is based on covert data values generated by the client device.

6. The method of claim 1, wherein the covert identifier is based on covert data generated by the server and provided by the server in a message to the client device.

7. The method of claim 1, wherein the covert identifier is based on covert data values generated by the client device and the server.

8. The method of claim 1, further comprising updating the covert identifier periodically at a client device based on predetermined event triggers and providing the updated covert identifier in a message to the server.

9. The method of claim 8, wherein at least one event trigger comprises installation of updated firmware on a client device.

10. The method of claim 8, wherein at least one event trigger comprises receipt of a predetermined number of a particular type of message from the server.

11. The method of claim 8, wherein at least one event trigger comprises sending a predetermined number of a particular type of message from the client device.

12. The method of claim 8, wherein at least one event trigger comprises a predetermined number of channel changes at the client device.

13. The method of claim 2, wherein the step of storing at least one covert identifier at the server comprises storing a first covert data value at the server on receipt of a predetermined message from a client device, and storing an updated, second covert data value when a subsequent predetermined message is received from a client device having the same credentials, and the step of determining whether a covert identifier received in a subsequent message from a client device matches a previously stored covert identifier comprises comparing a covert data value in the message with the first and second covert data values stored at the server, whereby detection of a cloned client device using the same credentials is reported if the covert data value in the subsequent message does not match at least one of the first and second covert data values.

14. The method of claim 13, wherein the covert data values are based on the time of sending the predetermined messages.

15. The method of claim 13, wherein the covert data values stored at the server are based on covert data values received in messages from at least one client device.

16. The method of claim 2, further comprising periodically changing at least one covert data value to a different covert data value based on a different operational event at a client device.

17. A method of renewing subscriber client devices on a network, comprising:

creating a covert identifier at a client device based on operational events at the client device;

receiving a service renewal message at the client device;

providing the covert identifier to the service provider in response to the service renewal message;

receiving a renewal code message at the client device over the network, the renewal code message containing a renewal unlock code based on the covert identifier; and

processing the renewal unlock code using the covert identifier to receive continued services from the service provider.

18. The method of claim 17, further comprising receiving an update covert identifier message at the client device prior to the service renewal message, and updating the covert identifier at the client device before providing the updated covert identifier to the service provider.

19. The method of claim 17, wherein the covert identifier comprises a code based on selected covert data values generated by different operational events at a client device.

20. The method of claim 17, wherein the step of providing the covert identifier to the service provider comprises sending the covert identifier in a message over the network to a server associated with the service provider.

21. A system for detecting cloned client devices on a network, comprising:

a server having a communication module which communicates with client devices over a network;

a data storage module associated with the server which stores a client identifier associated with at least one real client device registered for service with the server and at least one covert identifier received from a client device having the same client identifier; and

a clone detection module associated with the server and data storage module

which compares at least one covert identifier in a message received from a client device with the stored covert identifier associated with the same client identifier, and which creates a clone detection report if the covert identifiers do not match.

22. The system of claim 21, further comprising a plurality of client devices communicating with the server over the network.

23. The system of claim 22 wherein the client devices are smart cards.

24. The system of claim 22, wherein at least some of the client devices include smart cards.

25. The system of claim 22, wherein at least some of the client devices are set top boxes.

26. The system of claim 22, wherein at least some of the client devices are mobile communication devices.

27. The system of claim 22, wherein at least some of the client devices are personal computers.

28. The system of claim 22, wherein each client device has a covert identifier generating module which generates a covert identifier based on at least one covert data

value corresponding to an operational event at the client device, a covert data storage module which stores covert data values, and a message formatting module which embeds the covert identifier in at least one message sent to the server over the network.

29. The system of claim 28, wherein the covert identifier comprises at least one actual covert data value.

30. The system of claim 28, wherein the covert identifier comprises a transformed version of at least one covert data value.

31. The system of claim 28, wherein the covert identifier comprises a plurality of covert data values corresponding to different operational events at the client device.

32. The system of claim 28, wherein the covert identifier comprises a transformed version of a plurality of covert data values corresponding to different operational events at the client device.

33. A client device for communicating over a network, comprising:

a communication module which communicates with at least one server over a network;

a covert identifier generating module which creates at least one covert identifier based on at least one covert data value of an operational event at the client device; and

a data storage module associated with the covert data generating module which stores the covert data value.

34. The client device of claim 33, further comprising a message formatting module associated with the communication module and data storage module which creates at least one message containing the covert identifier for communication to the server.

35. The client device of claim 33, wherein the data storage module stores a covert data table of different covert data values of different operational events and the covert identifier is based on the covert data table.

36. The client device of claim 35, wherein the covert identifier comprises at least some of the covert data values in the covert data table.

37. The client device of claim 35, wherein the covert identifier is a transformation of at least some of the covert data values.

38. The client device of claim 35, further comprising a covert data update module configured to update the table of covert data values with at least some new covert data values in response to at least one predetermined covert data trigger.

39. The client device of claim 33, wherein the covert identifier generating module is configured to generate an updated client identifier based on new covert data values in response to a command.

40. The client device of claim 39, wherein the command comprises an update command received in a network message.

41. The client device of claim 39, wherein the command comprises a covert data trigger.

42. The client device of claim 39, further comprising a renewal module which responds to a renewal message received from a server of over the network by sending a current covert identifier to the server.

43. The client device of claim 33, comprising a smart card having an integral processor containing the communication module, covert identifier generating module, and data storage module.

44. The client device of claim 33, wherein the device is selected from the group consisting of set top boxes, personal computers, personal digital assistants, portable communication devices, media playing devices, and smart cards.

45. The client device of claim 33, wherein the client device is a silicon chip including a covert identifier generating module and data storage module.

46. The method of claim 1, wherein the covert identifier is at least partially based on at least one encryption key provided by the server to the client device.

47. The method of claim 1, wherein the covert identifier is at least partially based on at least one encryption key provided by the server to the client device and wherein said client uses the said server provided encryption key to encryption communications between said client and said server.

48. The method of claim 1, further comprising adding additional covert identifiers periodically at a client device based on predetermined event triggers wherein the said additional covert identifiers adds to the previous covert identifiers.

49. The method of claim 1, wherein the covert identifier is based on the time of day an event occurred in the client device.

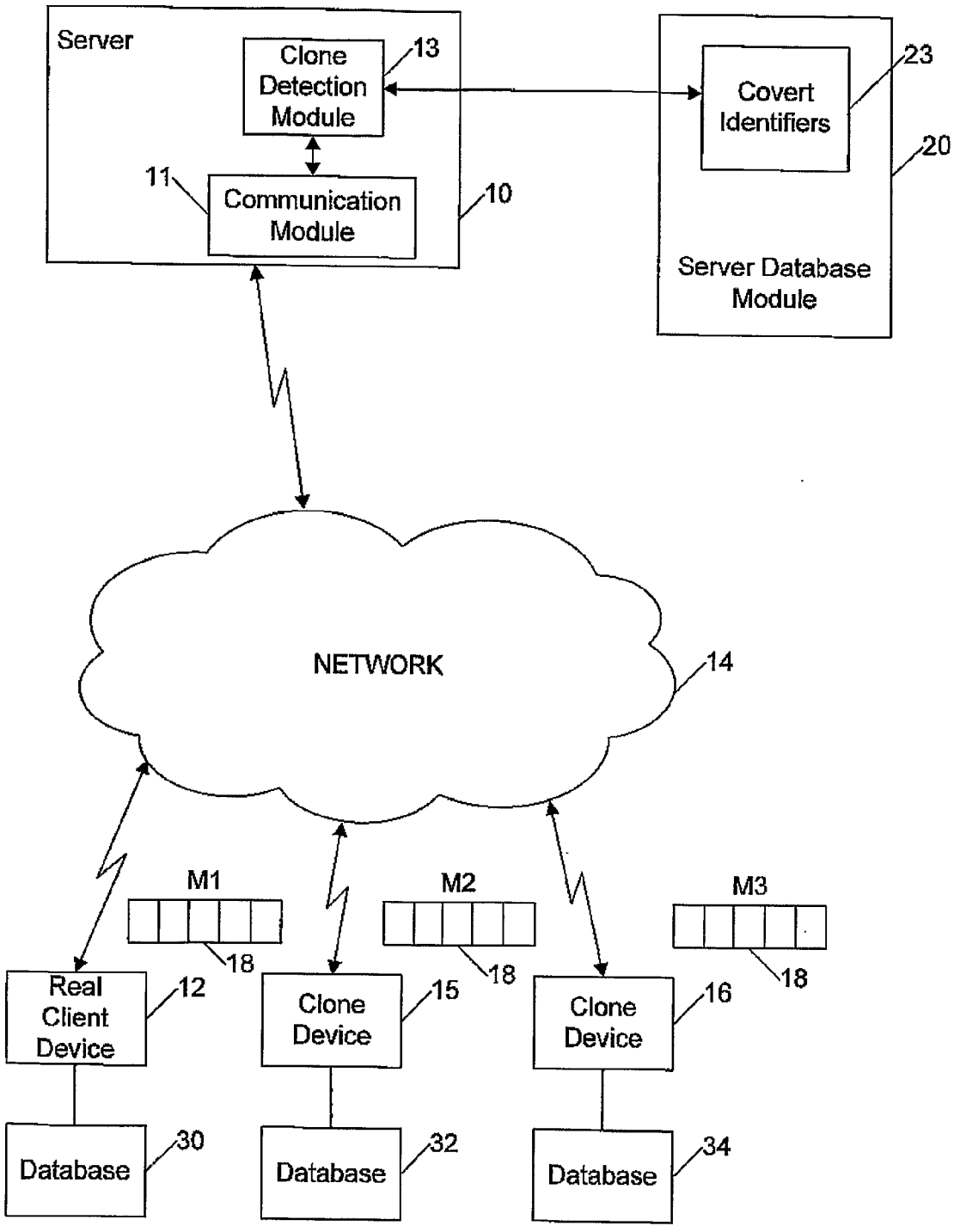

Server
Clone Detection Module
13
Communication Module
11
10
Covert Identifiers
23
20
Server Database Module
NETWORK
14
M1
M2
M3
18
18
18
Real Client Device
12
Clone Device
15
Clone Device
16
Database
30
Database
32
Database
34

FIG. 1

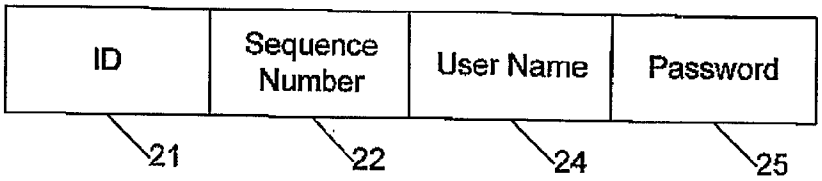



FIG. 2A
(PRIOR ART)

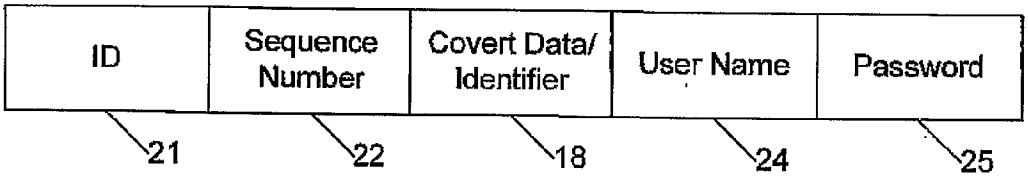



FIG. 2B

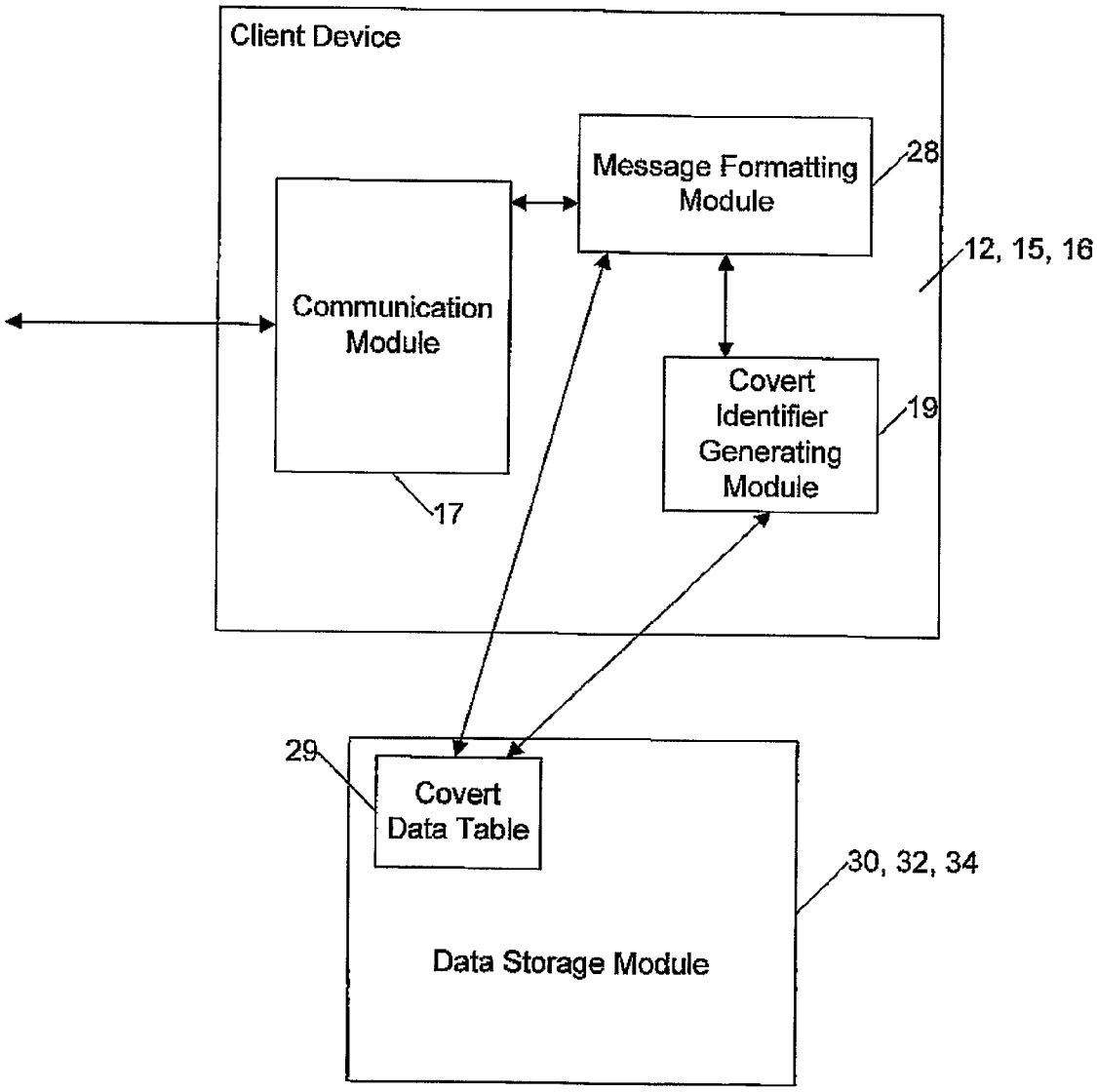

Client Device
Message Formatting Module
28
12, 15, 16
Communication Module
Covert Identifier Generating Module
19
17
29
Covert Data Table
30, 32, 34
Data Storage Module

FIG. 3

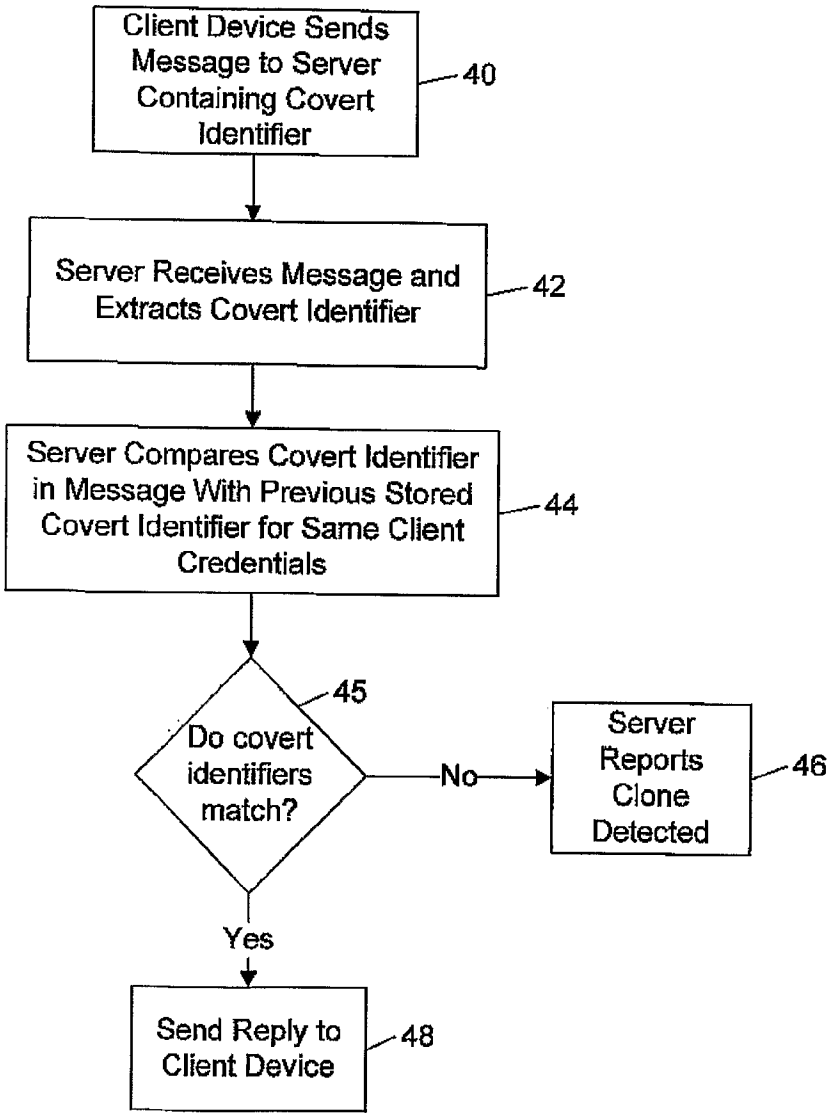

Client Device Sends Message to Server Containing Covert Identifier
40
Server Receives Message and Extracts Covert Identifier
42
Server Compares Covert Identifier in Message With Previous Stored Covert Identifier for Same Client Credentials
44
45
Do covert identifiers match?
No
Server Reports Clone Detected
46
Yes
Send Reply to Client Device
48

FIG. 4

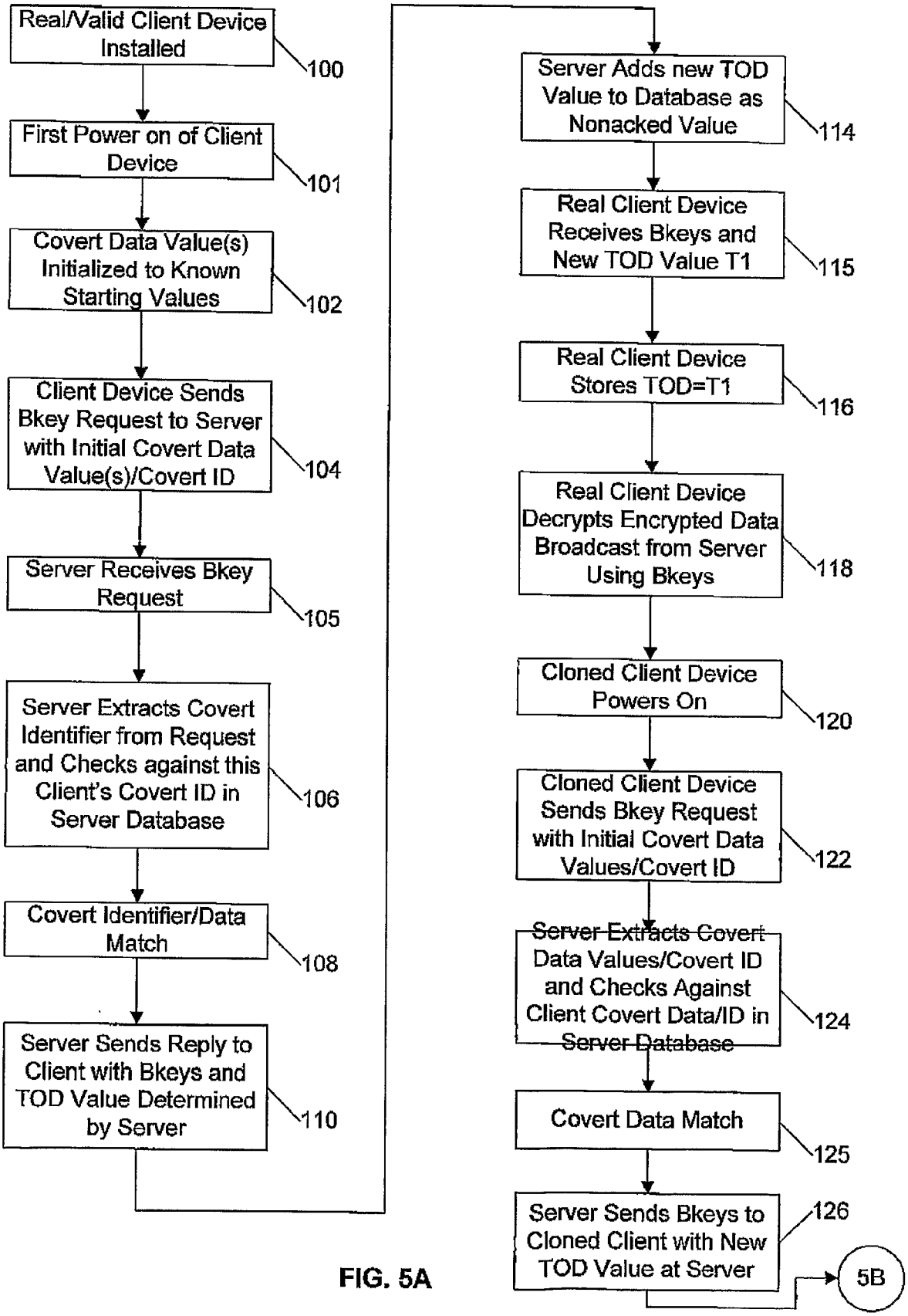

Real/Valid Client Device Installed
100
First Power on of Client Device
101
Covert Data Value(s) Initialized to Known Starting Values
102
Client Device Sends Bkey Request to Server with Initial Covert Data Value(s)/Covert ID
104
Server Receives Bkey Request
105
Server Extracts Covert Identifier from Request and Checks against this Client's Covert ID in Server Database
106
Covert Identifier/Data Match
108
Server Sends Reply to Client with Bkeys and TOD Value Determined by Server
110
Server Adds new TOD Value to Database as Nonacked Value
114
Real Client Device Receives Bkeys and New TOD Value T1
115
Real Client Device Stores TOD=T1
116
Real Client Device Decrypts Encrypted Data Broadcast from Server Using Bkeys
118
Cloned Client Device Powers On
120
Cloned Client Device Sends Bkey Request with Initial Covert Data Values/Covert ID
122
Server Extracts Covert Data Values/Covert ID and Checks Against Client Covert Data/ID in Server Database
124
Covert Data Match
125
Server Sends Bkeys to Cloned Client with New TOD Value at Server
126
5B

FIG. 5A

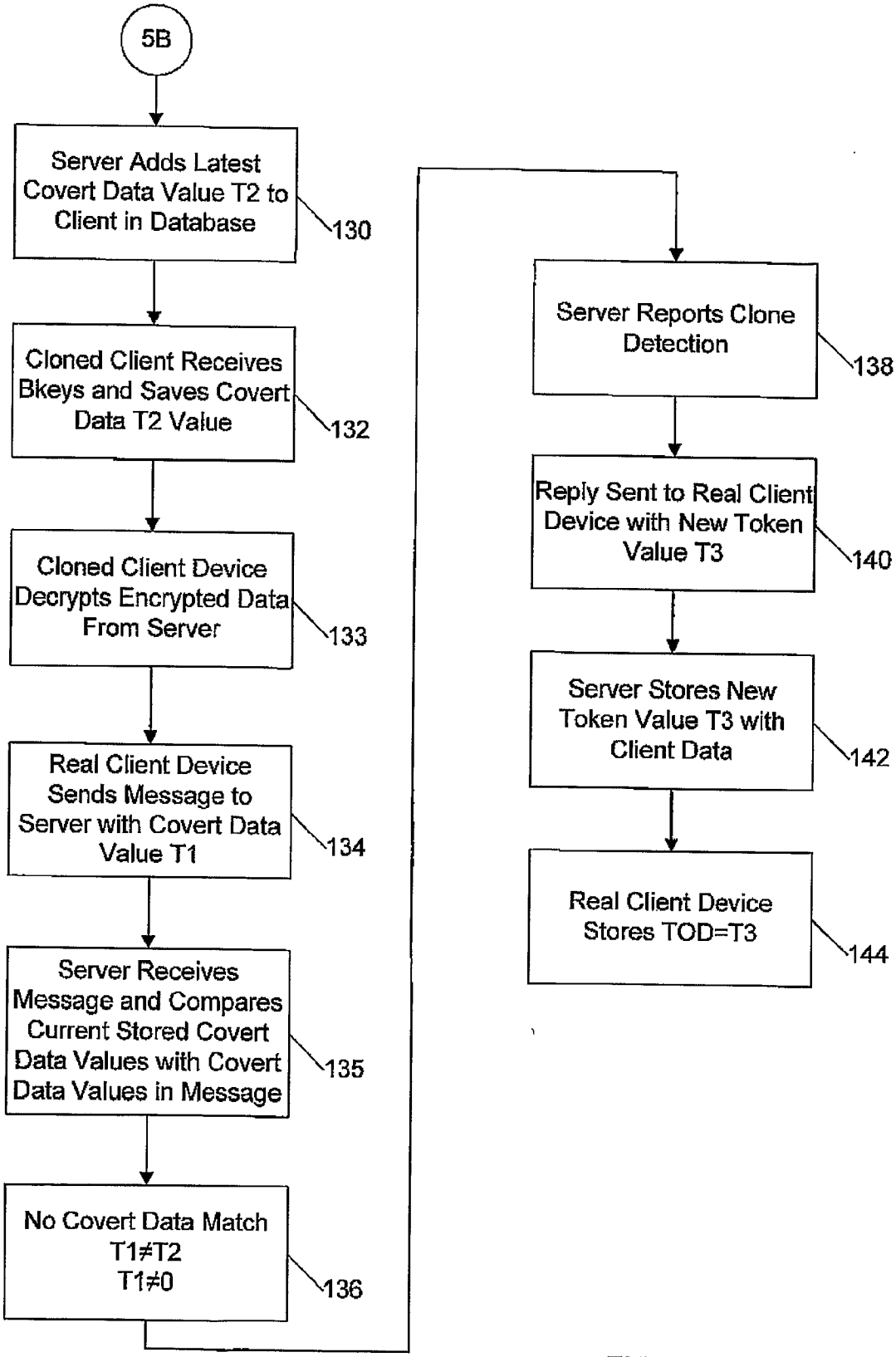

5B
Server Adds Latest Covert Data Value T2 to Client in Database
130
Cloned Client Receives Bkeys and Saves Covert Data T2 Value
132
Cloned Client Device Decrypts Encrypted Data From Server
133
Real Client Device Sends Message to Server with Covert Data Value T1
134
Server Receives Message and Compares Current Stored Covert Data Values with Covert Data Values in Message
135
No Covert Data Match
T1≠T2
T1≠0
136
Server Reports Clone Detection
138
Reply Sent to Real Client Device with New Token Value T3
140
Server Stores New Token Value T3 with Client Data
142
Real Client Device Stores TOD=T3
144

FIG. 5B

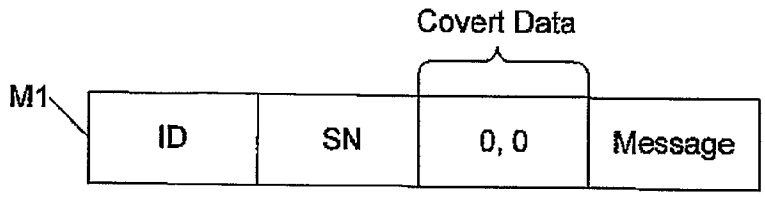



FIG. 6A

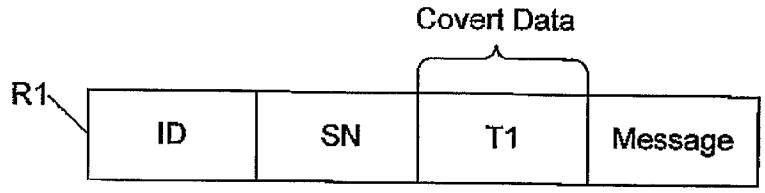



FIG. 6B

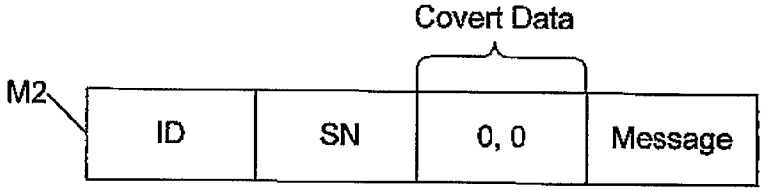



FIG. 6C

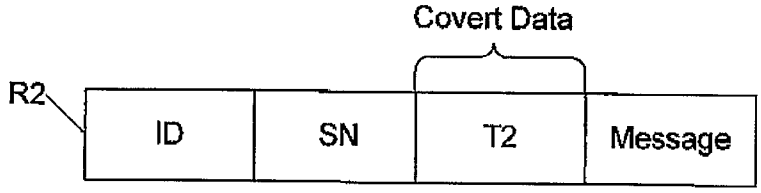



FIG. 6D

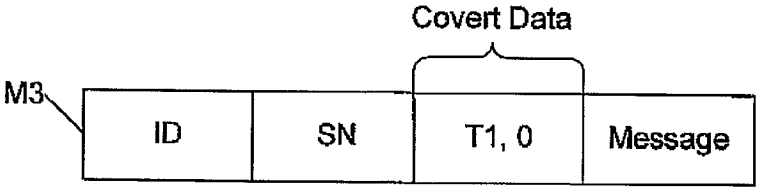



FIG. 6E

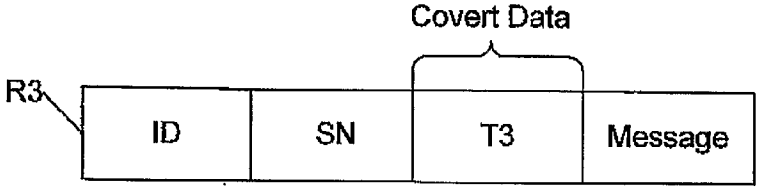



FIG. 6F

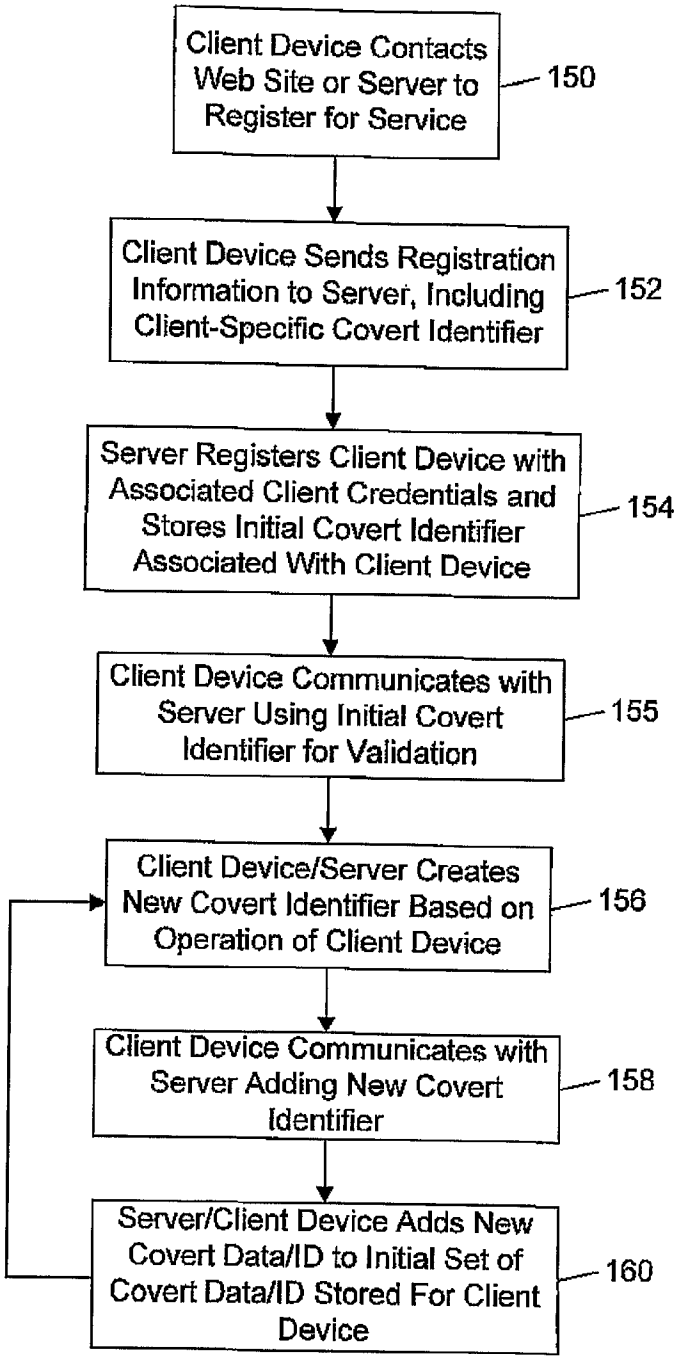

Client Device Contacts Web Site or Server to Register for Service
150
Client Device Sends Registration Information to Server, Including Client-Specific Covert Identifier
152
Server Registers Client Device with Associated Client Credentials and Stores Initial Covert Identifier Associated With Client Device
154
Client Device Communicates with Server Using Initial Covert Identifier for Validation
155
Client Device/Server Creates New Covert Identifier Based on Operation of Client Device
156
Client Device Communicates with Server Adding New Covert Identifier
158
Server/Client Device Adds New Covert Data/ID to Initial Set of Covert Data/ID Stored For Client Device
160

FIG. 7

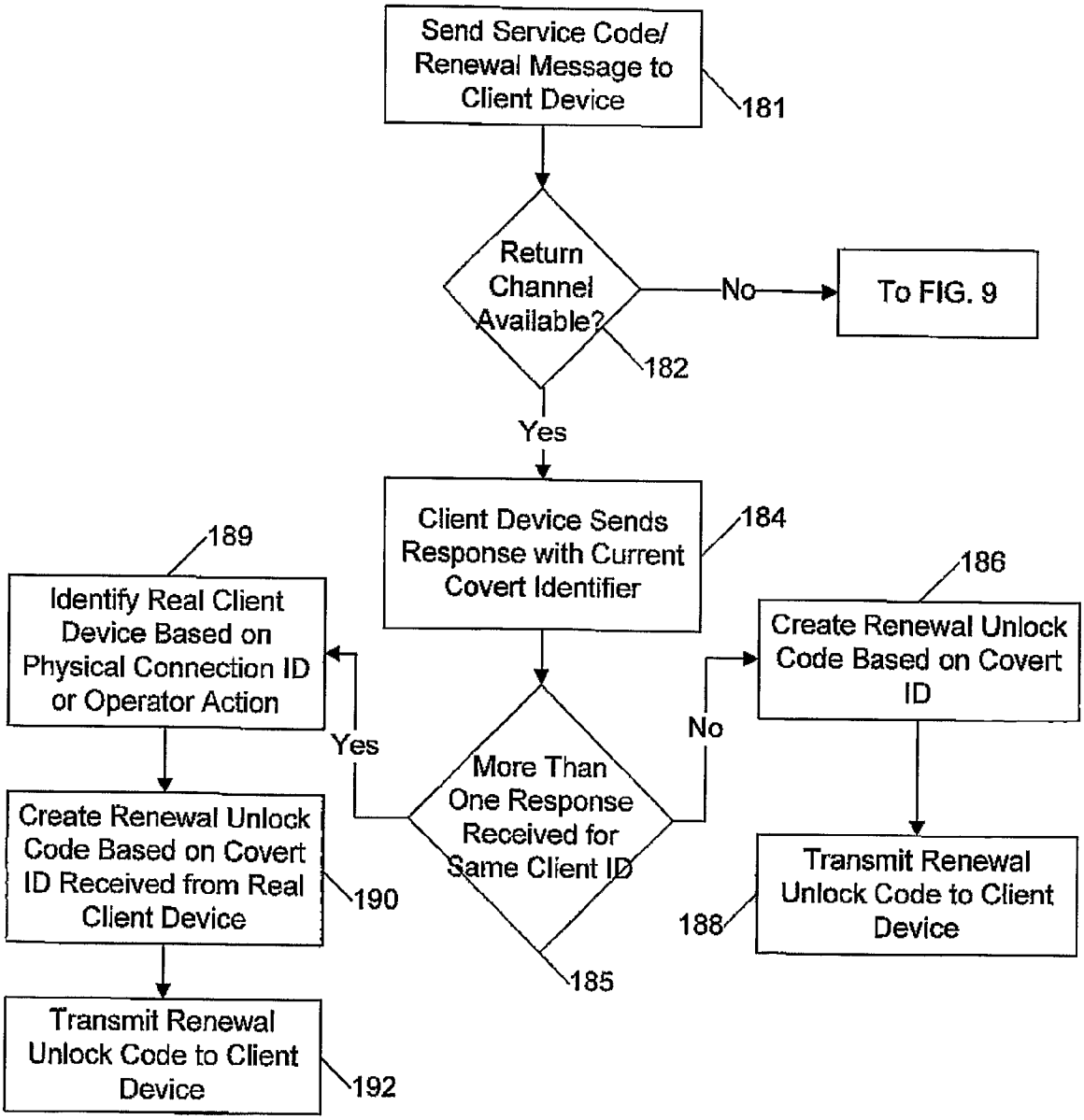
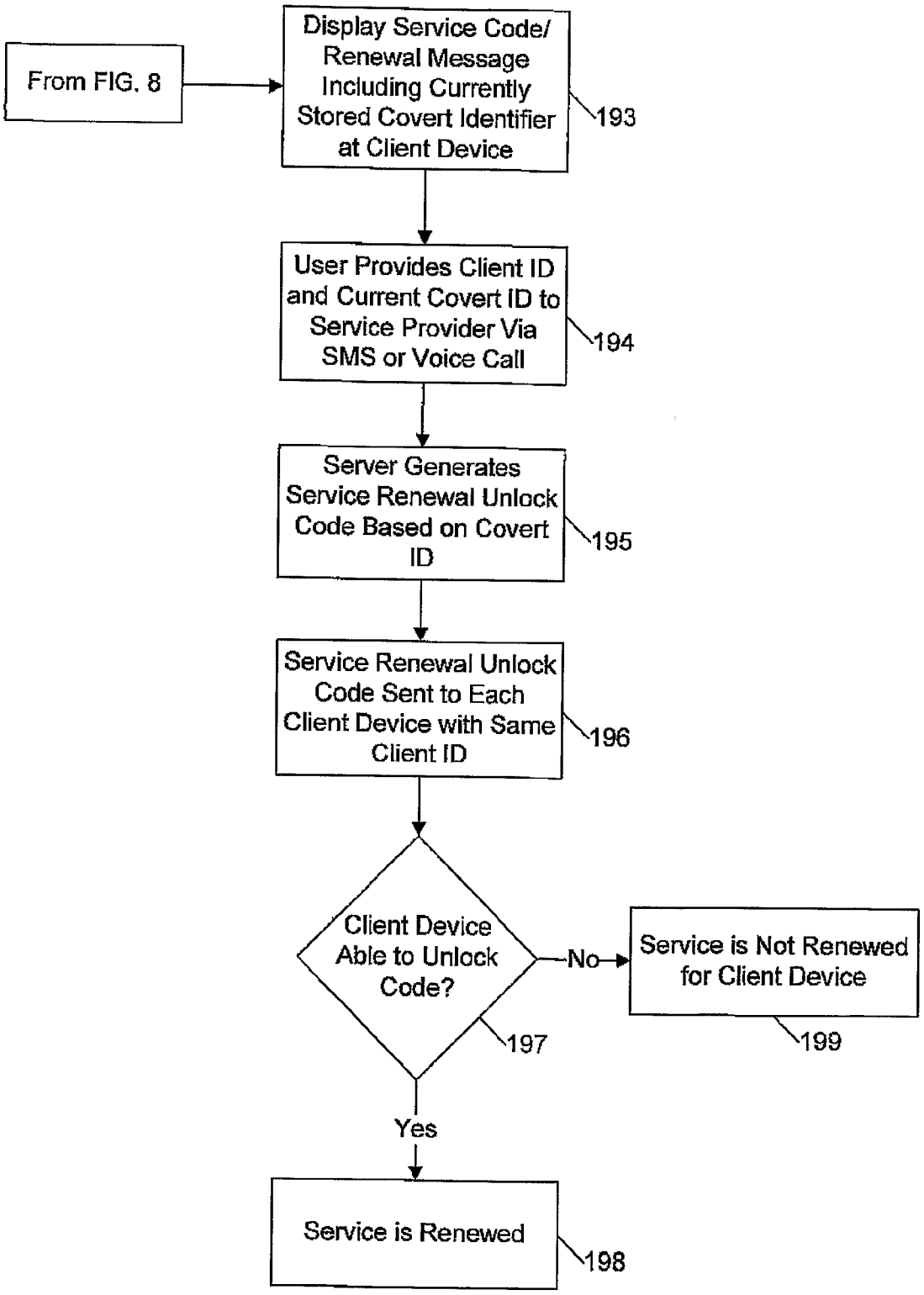

Send Service Code/ Renewal Message to Client Device
181
Return Channel Available?
No
To FIG. 9
182
Yes
Client Device Sends Response with Current Covert Identifier
184
189
Identify Real Client Device Based on Physical Connection ID or Operator Action
186
Create Renewal Unlock Code Based on Covert ID
Yes
More Than One Response Received for Same Client ID
No
Create Renewal Unlock Code Based on Covert ID Received from Real Client Device
190
Transmit Renewal Unlock Code to Client Device
188
185
Transmit Renewal Unlock Code to Client Device
192

FIG. 8


From FIG. 8
Display Service Code/ Renewal Message Including Currently Stored Covert Identifier at Client Device
193
User Provides Client ID and Current Covert ID to Service Provider Via SMS or Voice Call
194
Server Generates Service Renewal Unlock Code Based on Covert ID
195
Service Renewal Unlock Code Sent to Each Client Device with Same Client ID
196
Client Device Able to Unlock Code?
197
No
Service is Not Renewed for Client Device
199
Yes
Service is Renewed
198

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## Abstract

Provided is an indoor wireless positioning system and method including: a signal receiving unit receiving first signals from wireless communication access points and measuring strengths of the received first signals and a position estimating unit estimating a current position by comparing the strengths of the first signals measured by the signal receiving unit with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned. Accordingly, it is possible to rapidly and accurately create a fingerprint database and calculate position information on the terminal in the terminal or the server on the basis of the database information.

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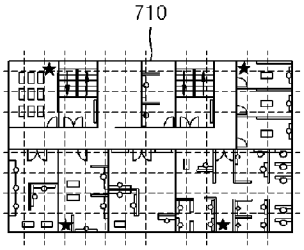
(54) Title: INDOOR WIRELESS POSITIONING SYSTEM AND METHOD




720

| COORDINATE | | | | | | 721 |
|---|---|---|---|---|---|---|
| x | y | AP # 1 | AP # 2 | · · · | AP # k | |
| $X_1$ | $Y_1$ | $S_{111}$ | $S_{112}$ | · · · | $S_{11k}$ | |
| $X_2$ | $Y_1$ | $S_{211}$ | $S_{212}$ | · · · | $S_{21k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_1$ | $S_{m11}$ | $S_{m12}$ | · · · | $S_{m1k}$ | |
| $X_1$ | $Y_2$ | $S_{121}$ | $S_{122}$ | · · · | $S_{12k}$ | |
| $X_2$ | $Y_2$ | $S_{221}$ | $S_{222}$ | · · · | $S_{22k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_2$ | $S_{m21}$ | $S_{m22}$ | · · · | $S_{m2k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_n$ | $S_{mn1}$ | $S_{mn2}$ | · · · | $S_{mnk}$ | |

(57) Abstract: Provided is an indoor wireless positioning system and method including: a signal receiving unit receiving first signals from wireless communication access points and measuring strengths of the received first signals and a position estimating unit estimating a current position by comparing the strengths of the first signals measured by the signal receiving unit with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned. Accordingly, it is possible to rapidly and accurately create a fingerprint database and calculate position information on the terminal in the terminal or the server on the basis of the database information.

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# Description

# INDOOR WIRELESS POSITIONING SYSTEM AND METHOD

## Technical Field

[1] The present invention relates to an indoor wireless positioning system and method, and more particularly, to a terminal-based positioning method and a server-based positioning method of providing a position of a terminal capable of creating a fingerprint database for indoor positioning using a wireless communication system such as a wireless local area network (WLAN), bluetooth, or an ultra-wideband (UWB) and using a software-based simulator.

## Background Art

[2] In general, due to the development of satellite-based global positioning system (GPS) receivers, GPS receivers have been used as positioning sensors in commercial vehicle navigation systems. For example, using position information on a vehicle acquired by the GPS receiver, a location based service (LBS) providing, for example, traffic information or a location-based information service is provided.

[3] However, in some cases, such as while indoors, in a tunnel, in an underground parking lot, or in the center of the city, the GPS receiver cannot completely or can only partially receive a GPS satellite signal. Therefore, there is a problem in that the GPS cannot continuously provide position information.

[4] Accordingly, various methods for indoor positioning have been studied. For example, the methods may include a method of using a high-sensitivity GPS receiver, pedestrian dead-reckoning using a Micro-Electro-Mechanical System (MEMS) sensor, and a wireless positioning method using a wireless communication signal. In particular, the wireless positioning system and method for positioning in the same manner as that of the GPS have been actively studied and developed with growing concerns.

[5] Indoor wireless positioning can be implemented using wireless communication devices using a wireless local area network (WLAN), bluetooth, or an ultra-wideband (UWB). Using the aforementioned devices has an advantage in that an infrastructure for the wireless communication is constructed indoors in advance.

[6] When the GPS is used outdoors, the GPS satellite and the receiver are in time synchronization with each other, so that a position is calculated using a time of arrival (ToA). However, a wireless communication access point (AP) for the indoor positioning and a modem are not in time synchronization with each other, so that the ToA cannot be used.

[7] In addition, in the WLAN, the APs are not in synchronization with each other, so that a time difference of arrival (TDoA) cannot be used either. Accordingly, in this case, a

position of the modem is calculated by measuring a strength of a signal transmitted from an AP.

[8] There are two methods of calculating the position of the modem by measuring the strength of the signal. One method is to estimate a distance between the AP and the modem using a propagation attenuation model of the signal to calculate the position by triangulation. The other method is to use a fingerprint database to estimate the position. Recently, the method of calculating the position in the fingerprint method has been widely studied. However, there are problems in that it takes much time to construct the database and it is difficult to accurately construct data.

## Disclosure of Invention

### Technical Problem

[9] The present invention provides an indoor wireless positioning system comprising: a signal receiving unit receiving first signals from wireless communication access points and measuring strengths of the received first signals; and a position estimating unit estimating a current position by comparing the strengths of the first signals measured by the signal receiving unit with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[10] According to an aspect of the present invention, there is provided an indoor wireless positioning system including: a signal receiving unit receiving first signals from wireless communication access points and measuring strengths of the received first signals and a position estimating unit estimating a current position by comparing the strengths of the first signals measured by the signal receiving unit with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[11] In the above aspect of the present invention, the signal receiving unit may receive the first signals transmitted from a number of the wireless communication access points and measure the strength of the first signal received from each access point.

[12] In addition, the position estimating unit may include a simulation unit which predicts the strengths of the second signals through the simulation using a signal propagation attenuation model on the basis of indoor map information showing a cross-section of the indoor space, indoor wall information including the thickness and material of an indoor wall, strengths of signals transmitted from the access points, position information on the access points, and movement information on the system.

[13] In addition, the position estimating unit may include a database unit which predicts the strengths of the second signals in the indoor space the system is currently positioned through the simulation for a number of the access points and records and stores the strength of the second signal with respect to each access point in the table.

[14] In addition, the position estimating unit may include a position determining unit which receives the first signals transmitted from a number of the wireless communication access points, compares the measured strength of the first signal from each access point with the table recording the strengths of the second signals predicted by the simulation of the indoor space the system is currently positioned for a number of the access points, and determines a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[15] In addition, the system may further include a signal correcting unit which receives the strength of the second signal predicted by the position estimating unit at the current position of the system and a third signal transmitted from the access point at a known position in the indoor space and corrects the strength of the second signal predicted by the position estimating unit according to an error calculated using a strength of the third signal and the strength of the second signal.

## Technical Solution

[16] According to another aspect of the present invention, there is provided an indoor wireless positioning method including: (a) receiving first signals transmitted from wireless communication access points and measuring strengths of the received first signals; and (b) estimating a current position by comparing the strengths of the first signals measured in (a) with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[17] According to another aspect of the present invention, there is provided an indoor wireless positioning method using an indoor wireless positioning system constructed with a mobile communication terminal and a positioning server, the method including: (a) the mobile communication terminal entering an indoor space and requesting information on a current position of the positioning server; (b) the positioning server receiving the request requesting the mobile communication terminal to select a mode from among a terminal-based position calculation mode and a server-based position calculation mode; (c) when the mobile communication terminal selects the terminal-based position calculation mode, the positioning server providing a table recording strengths of second signals predicted by a simulation of the indoor space where the mobile communication terminal is currently positioned to the mobile communication terminal; and (d) the mobile communication terminal receiving first signals transmitted from wireless communication access points, comparing measured strengths of the first signals with the strengths of the second signals recorded in the table, and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

## Advantageous Effects

[18] As described above, there is provided to the user an effective entire system and method for indoor wireless positioning capable of overcoming a limitation imposed by an indoor environment having built-in access points using indoor wireless communication devices using WLAN, Bluetooth, and UWB, providing the indoor environment-based fingerprint database creation method in order to provide reliable positioning information to a user, providing a database-based terminal position estimating method, and providing a terminal/server-based position estimating method.

[19] In addition, a simulation error of the software tool can be corrected using the hardware tool, so that it is possible to accurately provide an indoor wireless positioning result.

[20] The present invention is not limited to the aforementioned embodiments, but may be modified for use in applications such as indoor positioning based on the wireless communication using the WLAN and UWB or outdoor wireless positioning by those skilled in the art.

## Description of Drawings

[21] The above and other features and advantages of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings in which:

[22] FIG. 1 is a view showing a structure of a terminal-based indoor wireless positioning system according to an embodiment of the present invention;

[23] FIG. 2 is a flowchart showing a terminal-based indoor wireless positioning method according to an embodiment of the present invention;

[24] FIG. 3 is a view showing a structure of a server-based indoor wireless positioning system according to an embodiment of the present invention;

[25] FIG. 4 is a flowchart showing a server-based indoor wireless positioning method according to an embodiment of the present invention;

[26] FIGS. 5A to 5C are views showing a detailed structure of an indoor wireless positioning system according to an embodiment of the present invention;

[27] FIG. 6 is a flowchart showing a simulation process for a strength of a second signal according to an embodiment of the present invention;

[28] FIG. 7 is a view showing a table for strengths of second signals according to an embodiment of the present invention;

[29] FIG. 8 is a view showing signal correction operations after a simulation of strengths of second signals according to an embodiment of the present invention;

[30] FIG. 9 is a view showing a method of estimating a position of a terminal by comparing strengths of first signals with a table for strengths of second signals; and

[31] FIG. 10 is a flowchart showing an indoor wireless positioning method applying terminal-based and server-based calculation modes according to an embodiment of the

present invention.

## Best Mode

[32] According to another aspect of the present invention, there is provided an indoor wireless positioning method including: (a) receiving first signals transmitted from wireless communication access points and measuring strengths of the received first signals; and (b) estimating a current position by comparing the strengths of the first signals measured in (a) with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[33] In the above aspect of the present invention, in (a), the first signals transmitted from a number of the wireless communication access points may be received, and the strength of the first signal received from each access point may be measured.

[34] In addition, (b) may include predicting the strengths of the second signals through the simulation using a signal propagation attenuation model on the basis of indoor map information showing a cross-section of the indoor space, indoor wall information including the thickness and material of an indoor wall, strengths of signals transmitted from the access points, position information on the access points, and movement information on the system.

[35] In addition, (b) may include predicting the strengths of the second signals in the indoor space the system is currently positioned through the simulation for a number of the access points and recording and storing the strength of the second signal for each access point in the table.

[36] In addition, (b) may include receiving the first signals transmitted from a number of the wireless communication access points, comparing the measured strength of the first signal from each access point with the table recording the strengths of the second signals predicted by the simulation of the indoor space the system is currently positioned with respect to a number of the access points, and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[37] In addition, the method may further include receiving the strength of the second signal predicted in (b) at the current position and a third signal transmitted from the access point at a known position in the indoor space and correcting the strength of the second signal predicted in (b) according to an error calculated using a strength of the third signal.

[38] According to another aspect of the present invention, there is provided an indoor wireless positioning method using an indoor wireless positioning system constructed with a mobile communication terminal and a positioning server, the method including: (a) the mobile communication terminal entering an indoor space and requesting information on a current position of the positioning server; (b) the positioning server

receiving the request requesting the mobile communication terminal to select a mode from among a terminal-based position calculation mode and a server-based position calculation mode; (c) when the mobile communication terminal selects the terminal-based position calculation mode, the positioning server providing a table recording strengths of second signals predicted by a simulation of the indoor space where the mobile communication terminal is currently positioned to the mobile communication terminal; and (d) the mobile communication terminal receiving first signals transmitted from wireless communication access points, comparing measured strengths of the first signals with the strengths of the second signals recorded in the table, and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[39] In the above aspect of the present invention, the method may further include: (e) when the mobile communication terminal selects the server-based position calculation mode in (c), the terminal receiving the first signals transmitted from the wireless communication access points and providing the measured strengths of the first signals to the positioning server; and (f) the positioning server comparing the provided strengths of the first signals with the table recording the strengths of the second signal predicted by the simulation of the indoor space where the mobile communication terminal is currently positioned and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[40] In addition, in (d), the strength of the second signal and a third signal transmitted from the access point at a known position in the indoor space may be received, and the strength of the second signal may be corrected according to an error calculated using a strength of the third signal and the strength of the second signal.

## Mode for Invention

[41] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the attached drawings.

[42] FIG. 1 is a view showing a structure of a terminal-based indoor wireless positioning system according to an embodiment of the present invention. Referring to FIG. 1, the indoor wireless positioning system includes a terminal 100, a positioning server 120, and wireless communication access points.

[43] In a terminal-based position calculation mode, a fingerprint coarse database 101 transmitted from the server 120 to the terminal 100 is included. Here, the coarse database 101 is a fingerprint database having a small capacity constructed by setting fingerprint grids to be larger when a database for indoor positioning is created.

[44] The positioning server 120 transmits the fingerprint coarse database 101 stored in advance to the terminal 100. The terminal 100 stores the database 101 transmitted from the positioning server 120 in a memory.

[45] The terminal 100 receives signals from the access points indoors, extracts strengths of the signals, and uses the extracted information with the coarse database 101 stored in the memory to estimate a position of the terminal 100 in a fingerprint technique.

[46] FIG. 2 is a flowchart showing a terminal-based indoor wireless positioning method according to an embodiment of the present invention.

[47] After the terminal enters a building, the terminal requests a positioning service of the positioning server for indoor positioning (operation S200).

[48] When the positioning server receives the positioning service request, the positioning server requests the terminal to select a positioning calculation mode (operation S210). In this case, the terminal transmits information needed for a terminal-based position calculation mode to the positioning server (operation S220).

[49] Last, the positioning server transmits the fingerprint coarse database 101 to the terminal (operation S230).

[50] FIG. 3 is a view showing a structure of a server-based indoor wireless positioning system according to an embodiment of the present invention. Referring to FIG. 3, the indoor wireless positioning system includes a terminal 300, a positioning server 320, wireless communication access points, signal strengths 301 of the access points measured by the terminal 300 and transmitted to the positioning server 320, and a fine database 302 for fingerprints stored in the positioning server 320.

[51] Here, the fine database 302 is a fine fingerprint database constructed by setting fingerprint grids to be small when a database for the indoor positioning is created.

[52] The terminal 300 receives signals from the access points, extracts the signal strengths 301, and transmits the extracted signal strengths to the positioning server 320.

[53] The positioning server 320 estimates a position of the terminal 300 in the fingerprint technique using the signal strength information 301 transmitted from the terminal 300 with the fine database 302 stored in a memory. The estimated terminal position information is transmitted to the terminal 300.

[54] FIG. 4 is a flowchart showing a server-based indoor wireless positioning method according to an embodiment of the present invention.

[55] After the terminal enters a building, the terminal requests a positioning service of the positioning server for indoor positioning (operation S400).

[56] When the positioning server receives the positioning service request, the positioning server requests the terminal to select a positioning calculation mode (operation S410).

[57] In this case, the terminal transmits information needed for a server-based position calculation mode to the positioning server (operation S420).

[58] Thereafter, the positioning server waits for receipt of information on the signal strengths of the access points from the terminal. The terminal receives the signals from the access points for indoor positioning, extracts signal strength information (operation

S430), and transmits the extracted information to the positioning server (operation S440).

[59] The positioning server receiving the information estimates the position of the terminal on the basis of the fingerprint fine database stored in the memory in the fingerprint technique (operation S450).

[60] Last, the positioning server transmits the estimated position information to the terminal (operation S460).

[61] FIGS. 5A to 5C are views showing detailed structures of an indoor wireless positioning system according to an embodiment of the present invention.

[62] FIG. 5A shows a basic structure of the indoor wireless positioning system. A signal receiving unit 510 receives first signals transmitted from wireless communication access points and measures strengths of the received first signals.

[63] A position estimating unit 520 compares the strengths of the first signals measured by the signal receiving unit 510 with a table recording strengths of second signals predicted by a simulation of an indoor space where the terminal is currently positioned in order to estimate a current position.

[64] FIG. 5B shows a structure of the position estimating unit 520 in detail. A simulation unit 521 predicts the strengths of the second signals through a simulation using a signal propagation attenuation model on the basis of indoor map information showing a cross-section of the indoor space, indoor wall information including the thickness and material of an indoor wall, strengths of signals transmitted from the access points, position information on the access points, and movement information on the indoor wireless positioning system.

[65] A database unit 522 predicts the strengths of the second signals indoors where the terminal is currently positioned through a simulation for a number of the access points and records and stores the strengths of the second signals from the access points in the table.

[66] A position determining unit 523 receives the first signals transmitted from a number of the wireless communication access points, compares the measured strength of the first signal from each access point with the table recording the strengths of the second signals predicted by the simulation of the indoor space where the terminal is currently positioned for a number of the access points, and determines a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[67] FIG. 5C shows an expanded structure of the indoor wireless positioning system. A signal correcting unit 530 receives the strength of the second signal predicted by the position estimating unit 520 at the current position of the system and a third signal transmitted from the access point at a known position indoors and corrects the strength

of the second signal predicted by the position estimating unit 520 according to an error calculated using a strength of the third signal.

[68] Fingerprint database creation tools may include a software tool and a hardware tool.

[69] The software tool creates a fingerprint database indoors based on indoor environment information. The database is divided into a coarse database and a fine database according to a size of a fingerprint grid. The simulation unit 521 may correspond to the software tool.

[70] The hardware tool is used to correct an error made by the software tool. The hardware tool directly receives the signals from the access points at known indoor positions, calculates a position and an error on the basis of the fingerprint database, and corrects the error made by the software tool using the calculated information. According to the aforementioned construction, a reliable fingerprint database can be created using the software tool. The signal correcting unit 530 may correspond to the hardware tool.

[71] FIG. 6 is a flowchart showing a simulation process for a strength of a second signal according to an embodiment of the present invention.

[72] First, indoor environment information 610 is input into the software tool for an indoor positioning environment analysis.

[73] The indoor environment information 610 includes indoor map information, wall information, position information on the access points, access point transmission propagation strength information, movement information on people, and fingerprint grid interval information.

[74] When the indoor environment information 610 is input into the software tool, the software tool performs an indoor positioning environment simulation 620. In this case, the simulation content includes position accuracy at a fingerprint grid interval indoors and can accordingly display position reliability in a region as a percentage and an error contour line indoors on a map.

[75] Position adjustment of the access points to occupy desired position reliability in a region as a percentage and information on additional access points can be simulated.

[76] When the desired position reliability in a region as a percentage is obtained, the fingerprint database is created (operation 630). On the basis of the indoor environment information input to the software tool, the database is created at the fingerprint grid intervals.

[77] A database is constructed using the signal propagation attenuation model and estimating the signal strength information on the access points received at the fingerprint grid intervals on the basis of the information on the strengths of the propagation transmitted from the positions of the access points, the wall information, and the movement information on people (operation 630).

[78] The created database is stored in the memory of the positioning server (operation 640).

[79] FIG. 7 is a view showing a table for strengths of second signals according to an embodiment of the present invention.

[80] On the basis of the environment information input as a result of the fingerprint database creating process of the software tool, the strengths of the signals measured when the terminal receives the signals transmitted from the access points are simulated at the fingerprint grid intervals, and the simulated information is databased (operation 720).

[81] An estimated strength $S_{mnk}$ of a signal 721 includes a reception signal strength of the signal transmitted from an access point k having coordinates (m, n) and signal change covariance information.

[82] FIG. 8 is a view showing signal correction operations after a simulation of strengths of second signals according to an embodiment of the present invention.

[83] Correction of errors of the software tool is performed by the hardware tool in operations shown in FIG. 8. Signals transmitted from access points 801, 802, and 803 at known positions indoors are received by a wireless communication receiving unit 810.

[84] Signal strengths are extracted from the received signals, and a position is calculated by a processor unit 820 using the extracted information. Here, the fingerprint database created by the software tool 501 is used.

[85] Thereafter, the errors are calculated using the known position information. The errors of the software tool are corrected by an error correcting unit 830 using the calculated position and error information. By means of the correction operations, the software tool can create a reliable database.

[86] FIG. 9 is a view showing a method of estimating a position of the terminal by comparing the strengths of first signals with the table for the strengths of the second signals.

[87] As shown in FIG. 9, the terminal receives signals from the access points for position estimating. A signal strength combination 900 for the signals received from the access points during a predetermined time is created.

[88] In FIG. 9, $S_{tz}$ means a strength of z-th signal received from an access point t. The signal strength combination 900 is used with the fingerprint database in order to search for an optimal matching condition 910.

[89] According to a result of searching, a position (X, Y) 911 of the terminal can be estimated.

[90] FIG. 10 is a flowchart showing an indoor wireless positioning method applying terminal-based and server-based calculation modes according to an embodiment of the

present invention.

[91] A mobile communication terminal enters an indoor space and requests information on a current position of the positioning server (operation S1010).

[92] The positioning server receiving the request requests the terminal to select a mode from among a terminal-based position calculation mode and a server-based position calculation mode (operation S1020).

[93] When the mobile communication terminal selects the terminal-based position calculation mode (operation 1), the positioning server provides a table recording strengths of second signals predicted by a simulation of an indoor space where the mobile communication terminal is positioned to the mobile communication terminal (operation S1030).

[94] The terminal receives the first signals transmitted from the wireless communication access points, compares measured strengths of the first signals with the strengths of the second signals recorded in the table, and determines a position stored in the table corresponding to the strength of the second signal with a minimum error as a current position (operation S 1040).

[95] When the mobile communication terminal selects the server-based position calculation mode (operation 2), the terminal receives the first signals transmitted from the wireless communication access points and provides measured strengths of the first signals to the positioning server (operation S1050).

[96] The positioning server compares the provided strengths of the first signals with the table recording the strengths of the second signals predicted by the simulation of the indoor space where the mobile communication terminal is currently positioned performed by the positioning server, and determines a position stored in the table corresponding to the strength of the second signal with a minimum error as a current position (operation S1060). The determined current position is transmitted to the terminal (operation S1070).

[97] The invention can also be embodied as computer readable codes on a computer readable recording medium. The computer readable recording medium is any data storage device that can store data which can be thereafter read by a computer system. Examples of the computer readable recording medium include read-only memory (ROM), random-access memory (RAM), CD-ROMs, magnetic tapes, floppy disks, optical data storage devices, and carrier waves (such as data transmission through the Internet). The computer readable recording medium can also be distributed over network coupled computer systems so that the computer readable code is stored and executed in a distributed fashion.

[98] While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those skilled in the art that

various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the appended claims.

# Claims

[1] An indoor wireless positioning system comprising:
a signal receiving unit receiving first signals from wireless communication access points and measuring strengths of the received first signals; and
a position estimating unit estimating a current position by comparing the strengths of the first signals measured by the signal receiving unit with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[2] The system of claim 1, wherein the signal receiving unit receives the first signals transmitted from a number of the wireless communication access points and measures the strength of the first signal received from each access point.

[3] The system of claim 1, wherein the position estimating unit comprises a simulation unit which predicts the strengths of the second signals through the simulation using a signal propagation attenuation model on the basis of indoor map information showing a cross-section of the indoor space, indoor wall information including the thickness and material of an indoor wall, strengths of signals transmitted from the access points, position information on the access points, and movement information on the system.

[4] The system of claim 1, wherein the position estimating unit comprises a database unit which predicts the strengths of the second signals in the indoor space the system is currently positioned through the simulation for a number of the access points and records and stores the strength of the second signal with respect to each access point in the table.

[5] The system of claim 1, wherein the position estimating unit comprises a position determining unit which receives the first signals transmitted from a number of the wireless communication access points, compares the measured strength of the first signal from each access point with the table recording the strengths of the second signals predicted by the simulation of the indoor space the system is currently positioned for a number of the access points, and determines a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[6] The system of claim 1, further comprising a signal correcting unit which receives the strength of the second signal predicted by the position estimating unit at the current position of the system and a third signal transmitted from the access point at a known position in the indoor space and corrects the strength of the second signal predicted by the position estimating unit according to an error calculated using a strength of the third signal and the strength of the second signal.

[7] An indoor wireless positioning method comprising:
(a) receiving first signals transmitted from wireless communication access points and measuring strengths of the received first signals; and
(b) estimating a current position by comparing the strengths of the first signals measured in (a) with a table recording strengths of second signals predicted by a simulation for indoor space the system is currently positioned.

[8] The method of claim 7, wherein in (a), the first signals transmitted from a number of the wireless communication access points are received, and the strength of the first signal received from each access point is measured.

[9] The method of claim 7, wherein (b) comprises predicting the strengths of the second signals through the simulation using a signal propagation attenuation model on the basis of indoor map information showing a cross-section of the indoor space, indoor wall information including the thickness and material of an indoor wall, strengths of signals transmitted from the access points, position information on the access points, and movement information on the system.

[10] The method of claim 7, wherein (b) comprises predicting the strengths of the second signals in the indoor space the system is currently positioned through the simulation for a number of the access points and recording and storing the strength of the second signal for each access point in the table.

[11] The method of claim 7, wherein (b) comprises receiving the first signals transmitted from a number of the wireless communication access points, comparing the measured strength of the first signal from each access point with the table recording the strengths of the second signals predicted by the simulation of the indoor space the system is currently positioned for a number of the access points, and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[12] The method of claim 7, further comprising receiving the strength of the second signal predicted in (b) at the current position and a third signal transmitted from the access point at a known position in the indoor space and correcting the strength of the second signal predicted in (b) according to an error calculated using a strength of the third signal.

[13] An indoor wireless positioning method using an indoor wireless positioning system constructed with a mobile communication terminal and a positioning server, the method comprising:
(a) the mobile communication terminal entering an indoor space and requesting information on a current position of the positioning server;
(b) the positioning server receiving the request requesting the mobile communication terminal to select a mode from among a terminal-based position

calculation mode and a server-based position calculation mode;

(c) when the mobile communication terminal selects the terminal-based position calculation mode, the positioning server providing a table recording strengths of second signals predicted by a simulation of the indoor space where the mobile communication terminal is currently positioned to the mobile communication terminal; and

(d) the mobile communication terminal receiving first signals transmitted from wireless communication access points, comparing measured strengths of the first signals with the strengths of the second signals recorded in the table, and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[14] The method of claim 13, further comprising:

(e) when the mobile communication terminal selects the server-based position calculation mode in (c), the terminal receiving the first signals transmitted from the wireless communication access points and providing the measured strengths of the first signals to the positioning server; and

(f) the positioning server comparing the provided strengths of the first signals with the table recording the strengths of the second signal predicted by the simulation of the indoor space where the mobile communication terminal is currently positioned performed by the positioning server and determining a position stored in the table corresponding to a strength of a second signal with a minimum error as a current position.

[15] The method of claim 13, wherein in (d), the strength of the second signal and a third signal transmitted from the access point at a know position in the indoor space are received, and the strength of the second signal is corrected according to an error calculated using a strength of the third signal and the strength of the second signal.

[16] The method of claim 14, wherein in (e), the strength of the second signal and a third signal transmitted from the access point at a known position in the indoor space are received, and the strength of the second signal is corrected according to an error calculated using a strength of the third signal and the strength the second signal.

FIG. 1

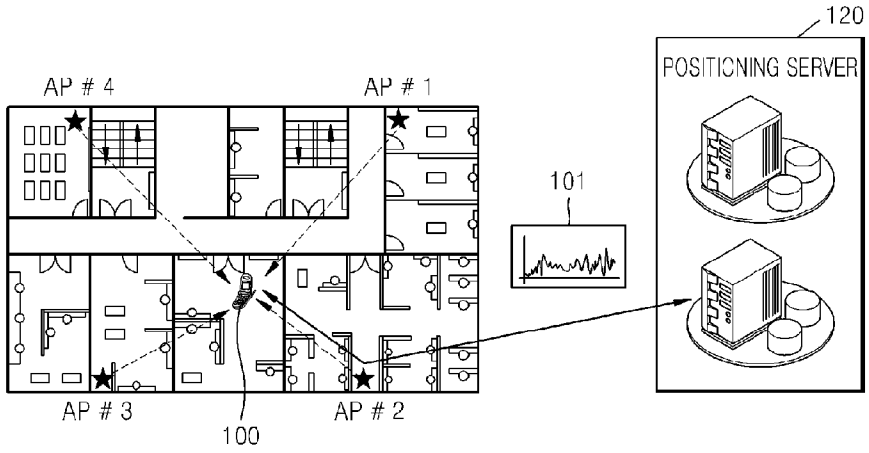

120
POSITIONING SERVER
AP # 4
AP # 1
101
AP # 3
AP # 2
100

FIG. 2

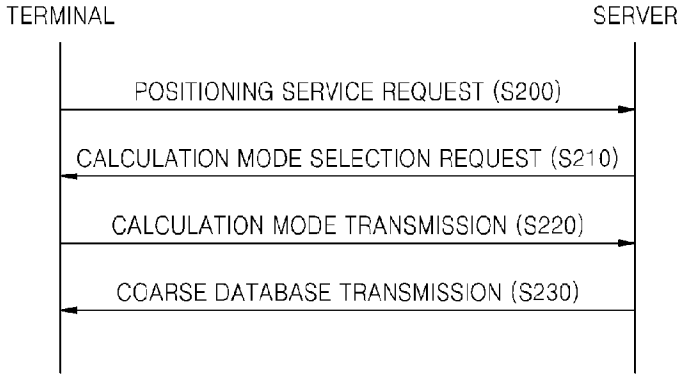

TERMINAL
SERVER
POSITIONING SERVICE REQUEST (S200)
CALCULATION MODE SELECTION REQUEST (S210)
CALCULATION MODE TRANSMISSION (S220)
COARSE DATABASE TRANSMISSION (S230)

FIG. 3

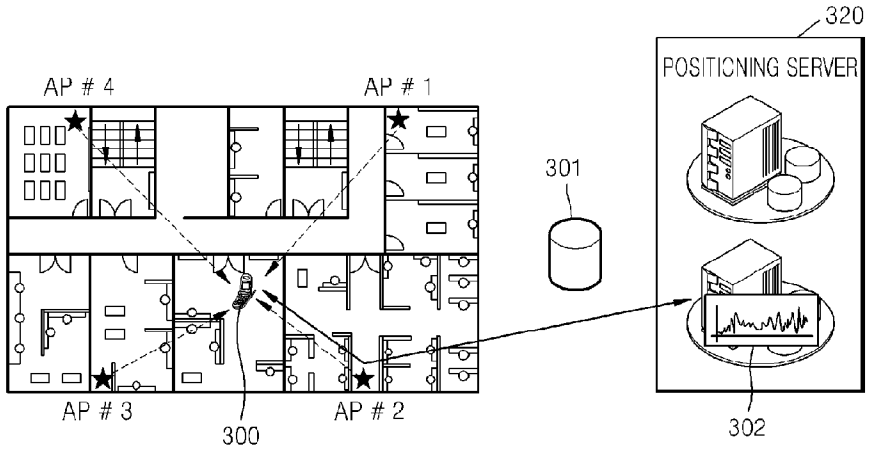

320
POSITIONING SERVER
AP # 4
AP # 1
301
AP # 3
AP # 2
300
302

FIG. 4

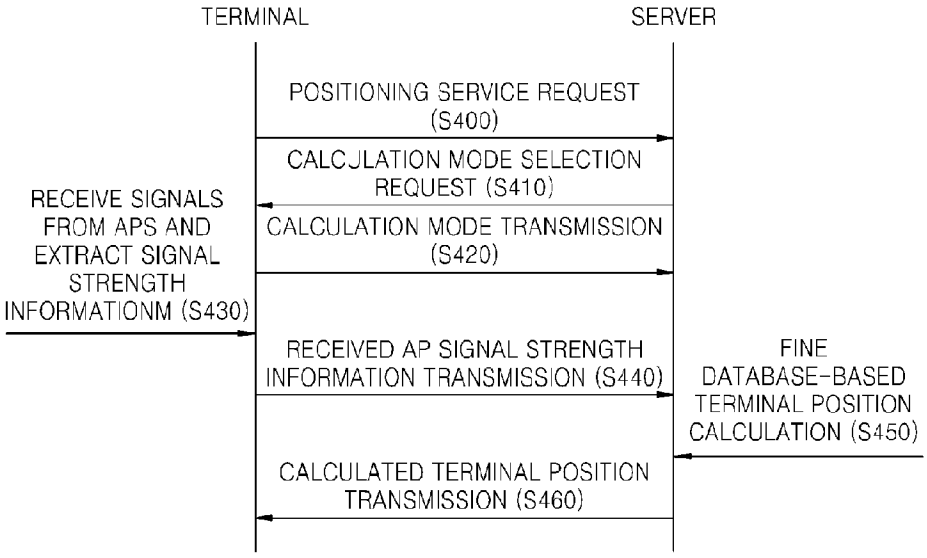

TERMINAL
SERVER
POSITIONING SERVICE REQUEST (S400)
CALCULATION MODE SELECTION REQUEST (S410)
RECEIVE SIGNALS FROM APS AND EXTRACT SIGNAL STRENGTH INFORMATIONM (S430)
CALCULATION MODE TRANSMISSION (S420)
RECEIVED AP SIGNAL STRENGTH INFORMATION TRANSMISSION (S440)
FINE DATABASE-BASED TERMINAL POSITION CALCULATION (S450)
CALCULATED TERMINAL POSITION TRANSMISSION (S460)

FIG. 5A

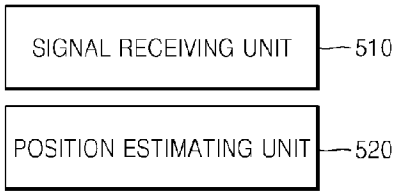



FIG. 5B

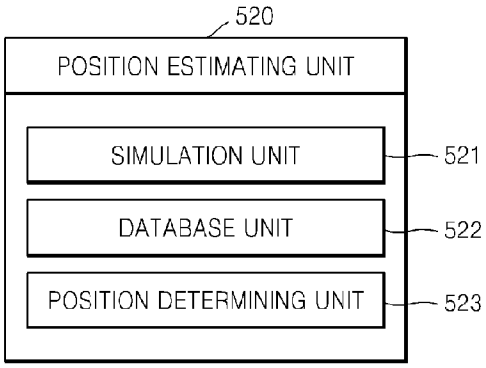



FIG. 5C

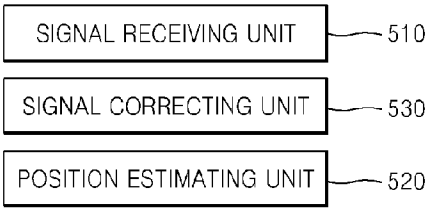


FIG. 6

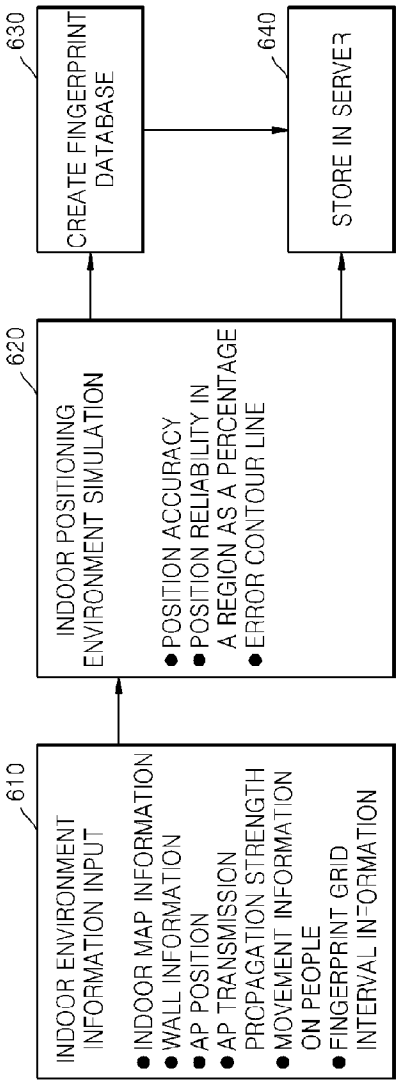
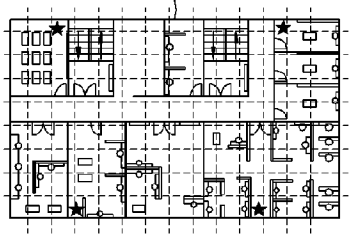

610
INDOOR ENVIRONMENT INFORMATION INPUT
● INDOOR MAP INFORMATION
● WALL INFORMATION
● AP POSITION
● AP TRANSMISSION PROPAGATION STRENGTH
● MOVEMENT INFORMATION ON PEOPLE
● FINGERPRINT GRID INTERVAL INFORMATION
620
INDOOR POSITIONING ENVIRONMENT SIMULATION
● POSITION ACCURACY
● POSITION RELIABILITY IN A REGION AS A PERCENTAGE
● ERROR CONTOUR LINE
630
CREATE FINGERPRINT DATABASE
640
STORE IN SERVER

FIG. 7




720

| COORDINATE | | | | | | 721 |
|---|---|---|---|---|---|---|
| x | y | AP # 1 | AP # 2 | · · · | AP # k | |
| $X_1$ | $Y_1$ | $S_{111}$ | $S_{112}$ | · · · | $S_{11k}$ | |
| $X_2$ | $Y_1$ | $S_{211}$ | $S_{212}$ | · · · | $S_{21k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_1$ | $S_{m11}$ | $S_{m12}$ | · · · | $S_{m1k}$ | |
| $X_1$ | $Y_2$ | $S_{121}$ | $S_{122}$ | · · · | $S_{12k}$ | |
| $X_2$ | $Y_2$ | $S_{221}$ | $S_{222}$ | · · · | $S_{22k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_2$ | $S_{m21}$ | $S_{m22}$ | · · · | $S_{m2k}$ | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋱ | ⋮ | |
| $X_m$ | $Y_n$ | $S_{mn1}$ | $S_{mn2}$ | · · · | $S_{mnk}$ | |

FIG. 8

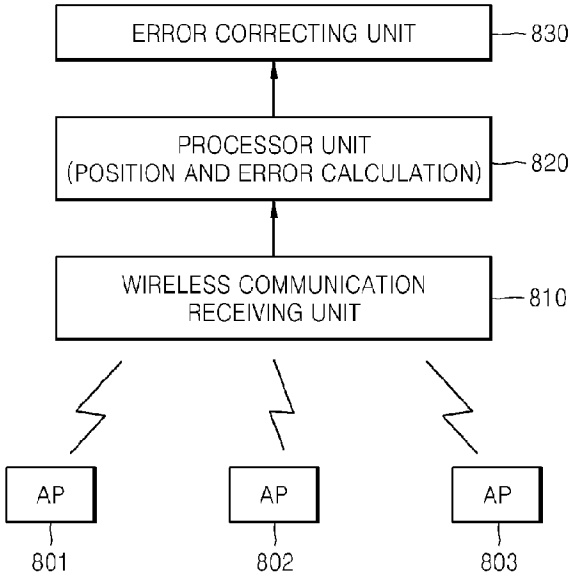

ERROR CORRECTING UNIT
830
PROCESSOR UNIT
(POSITION AND ERROR CALCULATION)
820
WIRELESS COMMUNICATION
RECEIVING UNIT
810
AP
AP
AP
801
802
803

FIG. 9

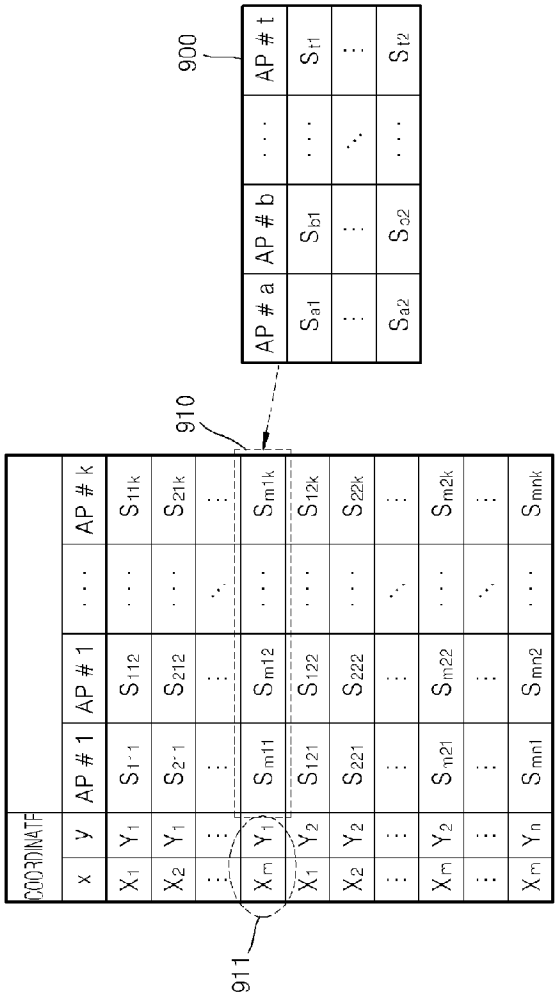
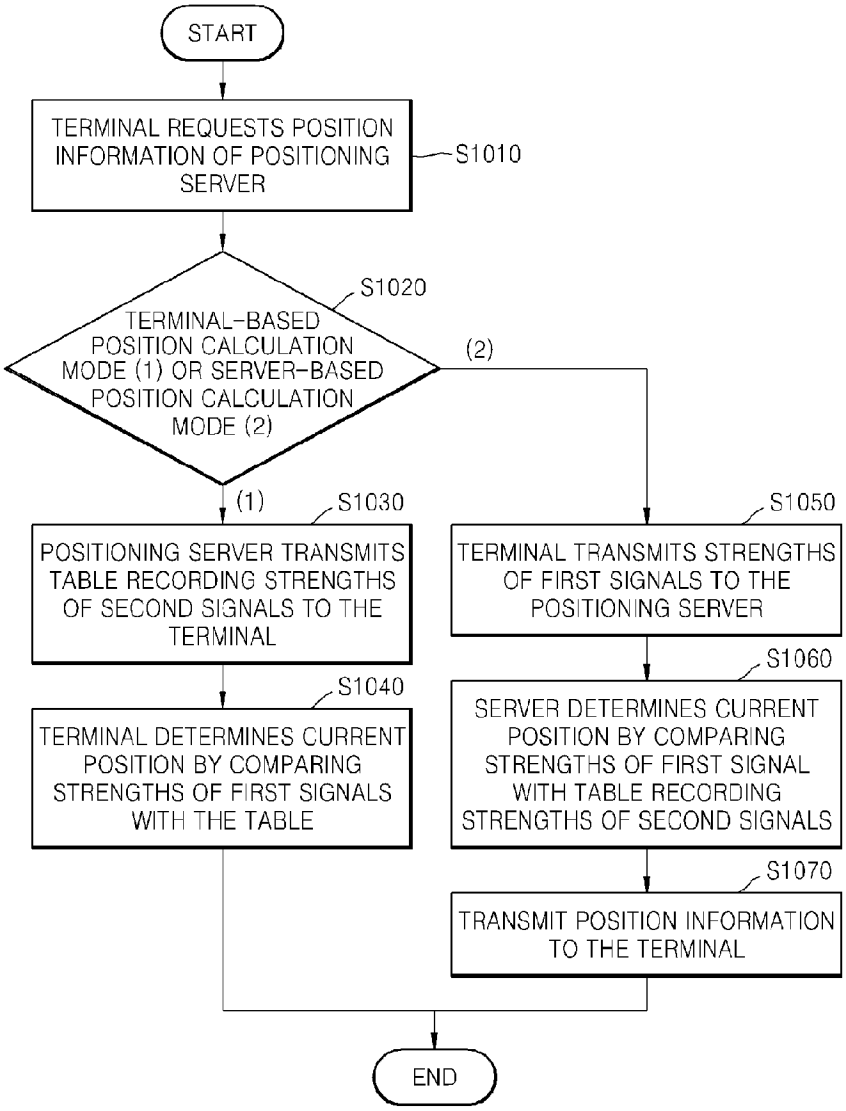


FIG. 10


START
TERMINAL REQUESTS POSITION INFORMATION OF POSITIONING SERVER
S1010
S1020
TERMINAL-BASED POSITION CALCULATION MODE (1) OR SERVER-BASED POSITION CALCULATION MODE (2)
(1)
(2)
S1030
POSITIONING SERVER TRANSMITS TABLE RECORDING STRENGTHS OF SECOND SIGNALS TO THE TERMINAL
S1040
TERMINAL DETERMINES CURRENT POSITION BY COMPARING STRENGTHS OF FIRST SIGNALS WITH THE TABLE
S1050
TERMINAL TRANSMITS STRENGTHS OF FIRST SIGNALS TO THE POSITIONING SERVER
S1060
SERVER DETERMINES CURRENT POSITION BY COMPARING STRENGTHS OF FIRST SIGNAL WITH TABLE RECORDING STRENGTHS OF SECOND SIGNALS
S1070
TRANSMIT POSITION INFORMATION TO THE TERMINAL
END

# INTERNATIONAL SEARCH REPORT

International application No.
**PCT/KR2007/005357**

## A. CLASSIFICATION OF SUBJECT MATTER

*G01S 1/02(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 G01S

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

KOREAN PATENTS AND APPLICATION FOR INVENTIONS SINCE 1975
KOREAN UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

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

eKIPASS(KIPO internal) & Keyword: "indoor, position, location, access point, wireless, power, signal, strength"

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US226578 B1 (Carl M. Panasik) 8 July 2003<br>See the Abstract, Fig. 1-3 | 1, 7, 13 |
| Y | KR 10-2006-0096509 A (Graumann David) 11 September 2006<br>See the Abstract, Claims 1-3 | 1, 7, 13 |
| A | US20060217132 A (3COM Corporation) 28 September 2006<br>See the Abstract, Fig. 1 | 1-16 |
| A | US20060148491 A (Samsung Electronics) 6 July 2006<br>See the Abstract, Fig. 6 | 1-16 |

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

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 05 FEBRUARY 2008 (05.02.2008) | **05 FEBRUARY 2008 (05.02.2008)** |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Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JANG Seok Hwan

Telephone No. 82-42-481-8250


Form PCT/ISA/210 (second sheet) (April 2007)

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/KR2007/005357**

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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| | | US6590884BA | 08.07.2003 |
| KR1020060096509 A | 11.09.2006 | CN1890924A | 03.01.2007 |
| | | EP01733509A1 | 20.12.2006 |
| | | EP1733509A1 | 20.12.2006 |
| | | JP2007513581T2 | 24.05.2007 |
| | | US2005135292A1 | 23.06.2005 |
| | | US2005135292AA | 23.06.2005 |
| | | W02005064855A1 | 14.07.2005 |
| US2006217132 A1 | 28.09.2006 | None | None |
| US2006148491 A1 | 06.07.2006 | None | None |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 43577005 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 23-AUG-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 16:42:04 |
| **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 | Non Patent Literature | 92_AnchorFree_919766.pdf | 1637423<br>1b58608997df4da1e944debdc324ad9d88b26297 | no | 13 |

**Warnings:**

| | | | | | |
|---|---|---|---|---|---|
| **Information:** | | | | | |
| 2 | Non Patent Literature | 93_MobileAssisted_919901.pdf | 2022730<br>9da2b3d8a4aaeaf500b292170722eaa8b2b8d67a | no | 12 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Non Patent Literature | 94_An_Architecture_919748.pdf | 1493979<br>6daf4b94570fc406bfbe6d06d28e68cb5fb7e02b | no | 15 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Non Patent Literature | 95_EX1003Declarati_919961.pdf | 1950678<br>115335cc3d80679a708dda95764eddb0668497e9 | no | 151 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Non Patent Literature | 96_P_370_919917.pdf | 1440797<br>10dccf97645462cbbf76c235211ed9efbc2d1620 | no | 34 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Non Patent Literature | 97_Grocery_Supply_919907.pdf | 1365020<br>cae974f5b66f3ae9193720878c8573ef6d816a41 | no | 10 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 7 | Non Patent Literature | 98_Intelligent_919908.pdf | 2288565<br>6985701ff255210784da801d42fa0149036c1dbc | no | 15 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Non Patent Literature | 99_zxvsvdsvds_919820.pdf | 450236<br>01a6997621f11252a3e59010cc45dfbe8281bc53 | no | 6 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

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|---|---|---|---|---|---|
| 9 | Non Patent Literature | 9_Case_Study_919911.pdf | 476764<br>7fff898b4af1dd09f3d13917c86d31310d8ae26d | no | 3 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Foreign Reference | 1_CA2235002A1_920287.pdf | 1434716<br>69f2fe05ee44c1a87717ae2df9b851b5e356b9d1 | no | 42 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 11 | Foreign Reference | 2_CA2688189A1_920288.pdf | 3736882<br>47916f540a87c7a1b1173da389d438af249cedd0 | no | 82 |
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| **Information:** | | | | | |
| 12 | Foreign Reference | 3_EP0156856A1_920123.pdf | 96082<br>1375e10d63026711419bec05c980b39589a83aa5 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 13 | Foreign Reference | 4_WO8501373A1_920124.pdf | 8842740<br>0fa6a06c5f37f294030a7292ed23766bf0ad0215 | no | 94 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 14 | Foreign Reference | 5_WO0158098A2_920289.pdf | 377574<br>eecea1c1887544d9e03355e6b46401dde28ebf8c | no | 5 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 15 | Foreign Reference | 6_WO0173575A1_920292.pdf | 959205<br>dd83d1764fd8a95ff21b440057cc865394d892b7 | no | 19 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 16 | Foreign Reference | 7_WO2007084973A2_920291.pdf | 3499504<br>eac291865c36839d14f3a7a61cd42e9d8f05c950 | no | 59 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 17 | Foreign Reference | 8_WO2008069446A1_920290.pdf | 1188483<br>0de9a52e9ec15879d5091d10882381b2641ea8aa | no | 28 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 33261378 | | |

**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 COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| Applicant's or agent's file reference<br>111052-89PCT | **FOR FURTHER ACTION** | see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |
|---|---|---|
| International application No.<br>PCT/US 18/12277 | International filing date *(day/month/year)*<br>04 January 2018 (04.01.2018) | (Earliest) Priority Date *(day/month/year)*<br>04 January 2017 (04.01.2017) |
| Applicant<br>AMI RESEARCH & DEVELOPMENT, LLC | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☐ as suggested by the applicant.

☒ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (January 2015)

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/12277

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: claims 1 and 2: drawn to a directional antenna apparatus having an output independent of both orientation of that apparatus and polarization of the radiated signal.

Group II: claim 3: drawn to an indoor positioning system.

Group III: claim 4: drawn to a directional antenna apparatus having a processor for using the azimuth, elevation, and known height information to locate the remote device in three dimensions.

---See continuation on supplemental page---

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-2

**Remark on Protest**

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/12277

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G01S 3/42; G01S 3/40; H01Q 3/12 (2018.01)
CPC - H01Q 3/08; H01Q 3/16; H01Q 3/12; H01Q 3/0005; G01S 3/08; G01S 3/40; G01S 3/42;

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History Document

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US 2014/0035791 A1 (Dielectric LLC) 06 February 2014 (06.02.2014), para [0018], [0020], [0040]. | 1-2 |
| Y | US 2014/0176385 A1 (AMI Research & Development LLC), 26 June 2014 (26.06.2014), para [0038]-[0039]. | 1-2 |
| Y | US 2007/0279311 A1 (Kai et al.) 06 December 2007 (06.12.2007), para [0038], [0040], [0049]-[0051]. | 1-2 |
| A | US 2008/0316131 A1 (Apostolos et al.) 25 December 2008 (25.12.2008), entire document. | 1-2 |
| A | US 8,988,303 B1 (AMI Research & Development LLC) 24 March 2015 (24.03.2015), entire document. | 1-2 |
| A | US 2008/0316128 A1 (Apostolos) 25 December 2008 (25.12.2008), entire document. | 1-2 |
| A | US 2009/0096691 A1 (Apostolos) 16 April 2009 (16.04.2009), entire document. | 1-2 |
| A | US 2009/0073049 A1 (Apostolos) 19 March 2009 (19.03.2009), entire document. | 1-2 |
| A | US 4,035,805 A (Mobley) 12 July 1977 (12.07.1977), entire document. | 1-2 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 01 May 2018 | 11 MAY 2018 |
| Name and mailing address of the ISA/US<br>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-8300 | Authorized officer:<br>Lee W. Young<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/12277

CONTINUATION OF BOX NO. III (LACK OF UNITY):

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Special technical features:

Group I requires a pair of crossed dipole elements, a loop elements; and wherein the output is independent of both orientation of the apparatus and polarization of the radiated signal.

Group II requires a beacon device for receiving a wireless signal from a tag device using an orientation independent antenna for receiving the wireless signal, the wireless signal having been transmitted from the tag device using a directional antenna, not found in the other groups.

Group III requires an orientation-independent antenna array located at a known height from a floor, and a processor, for using the azimuth, elevation, and known height information to locate the remote device in three dimensions, not found in the other groups.

Shared Features:
The only technical features shared by Groups I-III that would otherwise unify the groups are a directional antenna.

The only additional technical features shared by Groups I and III that would otherwise unify the groups are combining circuits to produce an output proportional to azimuth and elevation of a signal radiated from a remote device.

However, these shared technical features do not represent a contribution over prior art, because the shared technical features are disclosed by US 4,035,805 A to Mobley 12 July 1977 (12.07.1977), which discloses a directional antenna apparatus (col 1, ln 4-13 -1 AND ((azimuth W3 elevation) W2 signal) ) which includes combining circuits to produce an output proportional to azimuth and elevation of a signal radiated from a remote device (col 9, ln 4-36 -1 AND ((azimuth W3 elevation) W2 signal) -From the changes in signal strength, azimuth and elevation offset data are obtained. The azimuth offset is combined with the relative bearing data in the heading input unit 204 to provide the azimuth control signal. The elevation offset is provided in analog form by the unit 210 and is combined with the elevation signal from the digital to analog converters which represents the command data derived from the elevation thumbwheel switches by the heading input unit 204 to provide a composite elevation command signal.).

As the shared technical features were known in the art at the time of the invention, they cannot be considered special technical features that would otherwise unify the groups.

Groups I-III therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

# PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID J. THIBODEAU
VLP LAW GROUP LLP
555 BRYANT STREET
SUITE 820
PALO ALTO, CA 94301

# PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

| Date of mailing *(day/month/year)* | 11 MAY 2018 |
|---|---|

| Applicant's or agent's file reference | FOR FURTHER ACTION |
|---|---|
| 111052-89PCT | See paragraph 2 below |

| International application No. | International filing date *(day/month/year)* | Priority date *(day/month/year)* |
|---|---|---|
| PCT/US 18/12277 | 04 January 2018 (04.01.2018) | 04 January 2017 (04.01.2017) |

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G01S 3/42; G01S 3/40; H01Q 3/12 (2018.01)
CPC - H01Q 3/08; H01Q 3/16; H01Q 3/12; H01Q 3/0005; G01S 3/08; G01S 3/40; G01S 3/42;

Applicant AMI RESEARCH & DEVELOPMENT, LLC

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

| Name and mailing address of the ISA/US | Date of completion of this opinion | Authorized officer |
|---|---|---|
| Mail Stop PCT, Attn: ISA/US<br>Commissioner for Patents<br>P.O. Box 1450, Alexandria, Virginia 22313-1450<br>Facsimile No. 571-273-8300 | 01 May 2018 | Lee W. Young<br>PCT Helpdesk: 571-272-4300<br>PCT OSP: 571-272-7774 |

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/12277

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

a. ☐ forming part of the international application as filed:

☐ in the form of an Annex C/ST.25 text file.

☐ on paper or in the form of an image file.

b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/12277

**Box No. IV Lack of unity of invention**

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

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

Group I: claims 1 and 2: drawn to a directional antenna apparatus having an output independent of both orientation of that apparatus and polarization of the radiated signal.

Group II: claim 3: drawn to an indoor positioning system.

Group III: claim 4: drawn to a directional antenna apparatus having a processor for using the azimuth, elevation, and known height information to locate the remote device in three dimensions.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Special technical features:
Group I requires a pair of crossed dipole elements, a loop elements; and wherein the output is independent of both orientation of the apparatus and polarization of the radiated signal.

Group II requires a beacon device for receiving a wireless signal from a tag device using an orientation independent antenna for receiving the wireless signal, the wireless signal having been transmitted from the tag device using a directional antenna, not found in the other groups.

Group III requires an orientation-independent antenna array located at a known height from a floor, and a processor, for using the azimuth, elevation, and known height information to locate the remote device in three dimensions, not found in the other groups.

Shared Features:
The only technical features shared by Groups I-III that would otherwise unify the groups are a directional antenna.

The only additional technical features shared by Groups I and III that would otherwise unify the groups are combining circuits to produce an output proportional to azimuth and elevation of a signal radiated from a remote device.

However, these shared technical features do not represent a contribution over prior art, because the shared technical features are disclosed by US 4,035,805 A to Mobley 12 July 1977 (12.07.1977), which discloses a directional antenna apparatus (col 1, ln 4-13 -1 AND ((azimuth W3 elevation) W2 signal) ) which includes combining circuits to produce an output proportional to azimuth and elevation of a signal radiated from a remote device (col 9, ln 4-36 -1 AND ((azimuth W3 elevation) W2 signal) -From the changes in signal strength, azimuth and elevation offset data are obtained. The azimuth offset is combined with the relative bearing data in the heading input unit 204 to provide the azimuth control signal. The elevation offset is provided in analog form by the unit 210 and is combined with the elevation signal from the digital to analog converters which represents the command data derived from the elevation thumbwheel switches by the heading input unit 204 to provide a composite elevation command signal.).

As the shared technical features were known in the art at the time of the invention, they cannot be considered special technical features that would otherwise unify the groups.

Groups I-III therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-2

Form PCT/ISA/237 (Box No. IV) (January 2015)

**WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US 18/12277

**Box No. V** **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

| | | | |
|---|---|---|---|
| Novelty (N) | Claims | 1-2 | YES |
| | Claims | NONE | NO |
| Inventive step (IS) | Claims | NONE | YES |
| | Claims | 1-2 | NO |
| Industrial applicability (IA) | Claims | 1-2 | YES |
| | Claims | NONE | NO |

2. Citations and explanations:

Claim 1 lacks an inventive step under PCT Article 33(3) as being obvious over US 2014/0035791 A1 to Dielectric LLC (hereinafter Dielectric) in view of US 2014/0176385 A1 to AMI Research & Development LLC (hereinafter AMI).

Regarding claim 1, Dielectric discloses a directional antenna apparatus (antenna 10 having radiator 12; para [0018]- "FIG. 1 shows an antenna 10 having at least one radiator 12. In one embodiment, the radiator 12 is dual-loop crossed dipole radiator 12"), comprising:

a pair of crossed dipole elements (pair of cross-dipole elements 14; para [0020]- "FIG. 2 shows a four-element radiator 12 in greater detail. Hereinafter, the elements 14 will be referred to as "petals" 14, in view of their outlines, and four of these petals 14 make up a four-leaf-clover-shaped crossed-dipole radiator 12, as shown in FIG. 2");

a loop element (loop 16L, 36L; para [0020]- "Each petal 14 in the embodiment shown in FIG. 2 includes a plurality of segments. Specifically, each petal 14 includes a first plurality of segments that forms a first, e.g., outer, loop 16L and a second plurality of segments that forms a second, e.g., inner, loop 36L"); and

circuit to produce an output proportional to at least one of azimuth or elevation of a radiated signal, the output independent of both orientation of the apparatus and polarization of the radiated signal (circuit not shown for generating output proportional to azimuth of radiated signal, also is independent of orientation and polarization; see figure 4; para [0040]- "FIG. 4 presents, in polar chart 400 form, measured far-field signal strength versus azimuth for a dual-radiator antenna 10, such as the embodiment of the antenna 10 shown in FIG. 1 and described in greater detail above. As is typical in measuring performance of antennas 10 capable of circular polarization, the antenna 10 is affixed to a platform that is rotatable about a vertical axis and fed signals suited to causing circularly polarized emission, while the antenna 10 is repeatedly rotated through all azimuths. A calibrated, single-polarization receiving antenna in far field at about the same height as the antenna 10 under test is successively held fixed in a vertical orientation, held fixed in a horizontal orientation, and rotated relatively rapidly about an axis directed toward the antenna 10 under test, as the antenna 10 rotates relatively slowly through all azimuths. The chart 400 shows the received far-field signal strength when the calibrated antenna is vertically oriented 402, horizontally oriented 404, and rotating 406. The ratio of signal strength in the vertical 402 to horizontal 404 at each azimuth is a rough measure of axial ratio, assuming axial tilt to be zero. As stated above, the signal 406 from the rotating receiving antenna samples intermediate angles over all azimuths. The maximum and minimum excursions of the voltage trace at each azimuth define two curves similar to the vertical and horizontal axis measurements, but more accurately correspond to the relative magnitudes of the major axis and minor axis components of the polarization ellipse at that azimuth, and thus the axial ratio. For acquiring the data in this test chart 400, there was a 90 degree phase lag for one feed with respect to the other, with signals of equal strength applied to the respective inputs").

Dielectric does not disclose a combining circuit to produce the output.

AMI in the related art of crossed dipole antenna for communication discloses a combining circuit to produce output signal having different direction and polarizations (combiners; para [0038]- "The coaxial feedlines are connected as shown in the top view of FIG. 3A. The conductors 102-1, 102-2, 102-3, 102-4 are connected to the top plates 101-1, 101-2, 101-3, 101-4 at corresponding points near the center of the structure. The shield and inner conductors of the coaxial cables may be as arranged as will be discussed in more detail below"; para [0039]- "At the bottom of the structure the feed lines 102 can be connected to a combining network 300. The combining network, in one embodiment, consists of a pair of 180 degree hybrid combiners 301-1, 301-2 feeding a 90 degree hybrid combiner 302 as shown in FIG. 3B. This combining network 300 provides Left Hand (LH) 305-L and Right Hand (RH) 305-H circularly polarized (C-POL) feed points; other types of combining networks can be used to produce other types of directional and/or polarized signals. For example, a monopole pattern may be derived from the directional elements by feeding the sum ports of the 180 hybrids into a combiner (not shown). A switch controlled by decision logic (also not shown) can permit selection of one of these directional operating modes, such as for example, by selecting the mode that produces the highest received power at a given time").

It would have been obvious to a person having ordinary skill in the art to modify the antenna apparatus of Dielectric with the teaching of the combining circuit as disclosed by AMI as this would have provided the advantage for generating output signals having different type of directions and polarizations (para [0039]).

---See continuation on supplemental page---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 18/12277

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
Box No. V.2. Citations and Explanations:

Claim 2 lacks an inventive step under PCT Article 33(3) as being obvious over Dielectric in view of AMI and further in view of US 2007/0279311 A1 to Kai et al. (hereinafter Kai).

Regarding claim 2, Dielectric in view of AMI does not disclose a position detection system comprising a beacon device or tag device that use the antenna of claim 1 for reception and/or transmission of wireless signals.

Kai in the related art of position detection system discloses a tag device that use a directional crossed-dipole antenna that is orientation and polarization independent for reception and transmission of the wireless signals with improved distance (para [0038]- "In FIG. 4, an antenna pattern structure according to a first embodiment of the present invention is shown. The antenna pattern is formed using a conductive material of Cu, Ag, Al, or the like, on PET, film or paper material constituting a base body of a tag"; para [0040]- "In the pair of dipole antennas 1a, 1b, antenna lines extend in a cross shape from the feed point 20. At the end of the above antenna lines, the lines are bent with a right angle. Further, lines are expanded in a triangle shape. The overall sizes of the antenna pattern are 78 mm vertically and 78 mm horizontally. At feed point 20 locating at the center position of the cross shape, there is provided a mount portion of an LSI chip 2"; para [0048]- "FIGS. 7A and 7B show tag operation in case a linearly polarized wave 100 is used for the R/W antenna. In FIG. 7A, the polarization plane 100a of antenna la lies in the direction rotated by approximately 30 degrees from the left and right directions (horizontal direction), while the polarization plane of antenna 1b differs by 90 degrees therefrom; para [0049]- When linear polarization plane 100 of the R/W antenna coincides with the tag polarization plane, the communication distance becomes maximum, while when the above planes differ by 90 degrees, the communication distance becomes minimum. Accordingly, when attention is paid only to antenna la, if the tag is rotated 30 degrees counterclockwise, linear polarization plane 100 of the R/W antenna coincides with tag polarization plane 100a, and thereby a maximum communication distance is obtained. If the tag is rotated further by 90 degrees, at the rotation position of 120.degree., the communication distance becomes minimum. Such the state is shown with a broken line la in FIG. 7B. In this FIG. 7B, the horizontal axis shows the rotation angle, while the vertical axis shows the communication distance"; para [0050]- "On the other hand, when attention is paid to antenna 1b, there is a phase difference of 90.degree. from antenna 1a. In FIG. 7B, the relationship between the rotation angle and the communication distance is shown with a one-dot chain line 1b. Accordingly, in the composite characteristics of antennas 1a and 1b, it is understood that a tag having no large deterioration of the communication distance as a whole can be realized, as shown with the solid line indicated by (1a+1b) in FIG. 7B"; para [0051]- "The maximum distance at this time is approximately 1.4 times as compared to a case when using circular polarization for the R/W antenna and linear polarization for the tag as usual. Thus, it becomes possible to expand the communication distance in the RFID system").

It would have been obvious to a person having ordinary skill in the art to modify the antenna apparatus of Dielectric and AMI with the teaching of the position detection system comprising a tag device that uses a cross-dipole antenna for reception and transmission of wireless signals as disclosed Kai as this would have provided the advantage for configuring the tag device to use the antenna of claim 1 to provide maximum distance communication that is independent of orientation and polarization (para [0050]-[0051]).

Claims 1-2 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

# SEARCH HISTORY

| | |
|---|---|
| **Application Number** | PCT/US 18/12277 |
| **Search Conducted By** | LAP |
| **Search Approved By** | ADS |

| | |
|---|---|
| **CPC/IPC Classifications Searched** | IPC(8) – G01S 3/42; G01S 3/40; H01Q 3/12 (2018.01)<br>CPC-- H01Q 3/08; H01Q 3/16; H01Q 3/12; H01Q 3/0005; G01S 3/08; G01S 3/40; G01S 3/42; |
| **Date Conducted** | 30 April 2018 (30.04.2018) |

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|---|---|
| **Documentation Searched** | IPC(8)- G01S 3/42; G01S 3/40; H01Q 3/12 (2018.01)<br>CPC- H01Q 3/08; H01Q 3/16; H01Q 3/12; H01Q 3/0005; G01S 3/08; G01S 3/40; G01S 3/42; H01Q 21/26; H01Q 7/00<br>USPC– 342/422,426,428,432,450,451,408,386; 343/742,747,797 |
| **Search Terms Used** | Pair, dual, two, diagonal or crossed dipole, elements or patches, loop element, directional antenna, combining, azimuth, elevation, beacon tag, orientation independent antenna, polarization independent of radiated signals |
| **Date Conducted** | 30 April 2018 (30.04.2018) |

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| **Electronic Database Searched** | PatBase |
| **Files Searched** | Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO<br>Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW |
| **Date Conducted** | 30 April 2018 (30.04.2018) |

**Search Logic:**

- 1) (IC=(G01S3/42 OR G01S3/40 OR H01Q3/12)) (2233)
- 2) (CPC=(H01Q3/08 OR H01Q3/16 OR H01Q3/12 OR H01Q3/0005 OR G01S3/08 OR G01S3/40 OR G01S3/42 OR H01Q21/26 OR H01Q7/00)) (7197)
- 3) (UC=(342/422 OR 342/426 OR 342/428 OR 342/432 OR 342/450 OR 342/451 OR 342/408 OR

342/386 OR 343/742 OR 343/747 OR 343/797)) (3550)

- 4) 1 OR 2 OR 3 (11817)
- 5) 4 AND (antenna* OR radiator*) W7 (direction* OR steer*) (4434)
- 6) 5 AND (dipole* OR doublet*) W8 (cross* OR diagonal) (302)
- 7) 6 AND (loop* OR ring) W7 (element* OR radiator*) (78)
- 8) 7 AND (output* W8 (azimuth OR elevation)) (2)
- 9) 7 AND (output* W8 (combiner* OR (combin* near circuit*) OR summer*)) (6)
- 10) 6 AND (orientation W7 independ*) (9)
- 11) 5 AND (polarization W7 independent) (43)
- 12) 11 AND (orientation W7 independent) (6)
- 13) 11 AND ((radiat* OR transmi*) W7 polarization) (30)
- 14) 13 AND (cross* OR diagonal*) W7 (dipole* OR doublet*) (8)
- 15) 4 AND (antenna* OR radiator*) W8 (dipole* OR doublet*) (1983)
- 16) 15 AND (cross* OR diagonal) W7 (element* OR radiator* OR antenna*) (861)
- 17) 16 AND (loop* OR ring*) W7 (element* OR radiator*) (258)
- 18) 17 AND (output* W7 independ*) (8)
- 19) 17 AND (orient* W7 independent*) (9)
- 20) 18 AND (polarization W7 independent) (1)
- 21) (PN=(US20140035791 OR US20120098725 OR US20090096691 OR US20080316128 OR US200900730249 OR US20070279311 OR US20140035792 OR US20080316131 OR US4035805 OR US9118116 OR US8988303)) (9)
- 22) CTB 21 OR CTF 21 (170)
- 23) 22 AND (radiat* OR transmi*) W7 (signal* OR wave*) (108)
- 24) 23 AND ((antenna* OR radiator*) W8 orientation*) (33)
- 25) 24 AND (independ* W7 (orientation OR polarization*)) (8)
- 26) (direction* OR steer*) W8 (antenna* OR radiator*) (97406)
- 27) 26 AND (dipole* W7 (cross* OR diagonal*)) (1178)
- 28) 27 AND (loop* OR ring*) W7 (element* OR component*) (182)
- 29) 28 AND ((combiner* OR (combin* near circuit*)) W8 output*) (6)
- 30) 28 AND (orientation W8 (antenna* OR radiator*)) (48)
- 31) 30 AND (radiat* OR transmi*) W8 (polar* OR polarization) (36)
- 32) 31 AND (independ* W8 (orientation OR polar*)) (10)
- 33) 26 AND (beacon* OR tag*) W8 (antenna* OR radiator*) (4711)
- 34) 33 AND (cross* OR diagonal) W7 (dipole* OR element*) (277)
- 35) 34 AND (orientation* W7 independent) (9)
- 36) 35 AND (polarization W7 independent*) (1)
- 37) 27 AND (orientation W7 (antenna* OR radiator*)) (243)
- 38) 37 AND (independ* W7 orientation*) (26)
- 39) 37 AND (polarization W7 independent) (5)
- 40) (PA=(AMI W2 Research)) (29)
- 41) (PA=(Apostolos W2 John)) (51)
- 42) (IN=(Apostolos W2 John)) (103)
- 43) (IN=(Mouyos W2 William)) (31)
- 44) (IN=(Logan W2 James)) (350)
- 45) (IN=(Joseph W2 Sean)) (73)
- 46) 41 OR 42 OR 43 OR 44 OR 45 (523)

- 47) 46 AND (antenna* OR radiator*) W8 (dipole* OR (cross* near dipole*)) (20)
- 48) 47 AND ((orientation OR polarization) W7 independent) (2)

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|---|---|
| **Electronic Database Searched** | Google |
| **Files Searched** | Scholar (Articles excluding patents) |
| **Date Conducted** | 30 April 2018 (30.04.2018) |

**Search Logic:**

orientation polarization independent directional antenna pair of dipole (elements OR patches) loop combiner output radiated signal (azimuth OR elevation) -about 564 results (0.13 sec)

orientation independent directional antenna pair of crossed dipole (elements OR patches) loop combiner generate output radiated signal (azimuth OR elevation) polarization independent -about 498 results (0.12 sec)

(beacon OR tag) device use orientation independent directional antenna pair of crossed dipole (elements OR patches) loop combiner generate output radiated signal (azimuth OR elevation) polarization independent -about 115 results (0.12 sec)

orientation-independent directional antenna pair of dipole (elements OR patches) loop combiner generate output radiated signal (azimuth OR elevation) polarization independent -about 3 results (0.07 sec)

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| **Electronic Database Searched** | Google |
| **Files Searched** | Patents |
| **Date Conducted** | 30 April 2018 (30.04.2018) |

**Search Logic:**

directional antenna comprising (dual OR pair) crossed dipole (elements OR patches) loop (combing circuit OR combiner) generate output radiated signal (azimuth OR elevation) independent of orientation of antenna polarization of radiated signal -about 562 results (0.71 seconds)

orientation independent directional antenna comprising (dual OR pair) crossed dipole (elements OR patches) loop (combing circuit OR combiner) generate output radiated signal (azimuth OR elevation) independent of polarization of radiated signal -about 562 results (0.48 seconds)

orientation independent directional antenna comprising (dual OR pair OR two) (diagonal OR crossed) dipole (elements OR patches) loop (combing circuit OR combiner) generate output radiated signal (azimuth OR elevation) independent of polarization of radiated signal -about 274 results (0.62 seconds)

orientation independent directional (radiator OR antenna) (dual OR pair OR two) (diagonal OR crossed) dipole (elements OR patches) loop (combing circuit OR combiner) generate output proportional to radiated signal (azimuth OR elevation) independent of polarization of radiated signal -about 204 results

(0.67 seconds)

orientation independent directional (radiator OR antenna) (dual OR pair OR two) (diagonal OR crossed) dipole (elements OR patches) loop (combing circuit OR combiner) generate output proportional to (azimuth OR elevation) of radiated signal output is independent of polarization of radiated signal -about 203 results (0.59 seconds)

orientation independent directional (antenna OR radiator) (crossed OR diagonal) dipole (antenna OR radiator OR element) loop -about 3840 results (0.43 seconds)

orientation independent directional (antenna OR radiator) (crossed OR diagonal) dipole (antenna OR radiator OR element) loop output independent of radiated signal polarization -about 2670 results (0.61 seconds)

orientation independent directional (antenna OR radiator) (crossed OR diagonal) dipole (antenna OR radiator OR element) loop generate output proportion to (azimuth OR elevation) of radiated signal polarization independent -about 649 results (0.53 seconds)

orientation independent (directional OR steerable) (crossed OR diagonal) dipole (antenna OR radiator) output independent of polarization of radiated signal -about 2790 results (0.46 seconds)

Supplemental Search (SAO-ADS):

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|---|---|
| **Electronic Database Searched** | PatBase |
| **Files Searched** | Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO<br><br>Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW |
| **Date Conducted** | 02 May 2018 (02.05.2018) |
| **Search Logic:** | |
| 1 PN=(US2014035791 OR US2014176385 OR US2007279311 OR US2008316131 OR US8988303 OR US2008316128 OR US2009096691 OR US2009073049 OR US4035805) 9<br>2 pn=us20140176385 1<br>3 2 AND (beacon* OR tag* OR rfid* OR theft*) 0<br>4 1 NOT 2 8<br>5 4 AND (cross* W2 dipole) 2<br>6 5 AND loop* 1<br>7 6 AND (combining WF2 circuit) 0<br>8 cpc=(H01Q3/08 OR H01Q3/16 OR H01Q3/12 OR H01Q3/0005 OR G01S3/08 OR G01S3/40 | |

OR G01S3/42) 2226
9 8 AND (cross* WF2 dipole*) 14
10 (cross* WF2 dipole*) 1569
11 10 AND (loop* WF2 (element* OR segment* OR part* OR side* OR antenna*)) 144
12 11 AND ((combin* OR join*) W3 (circuit*)) 10
13 9 OR 12 24

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 43576858 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 23-AUG-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 16:35:39 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

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|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Non Patent Literature | 46_13015306_919945.pdf | 16657896<br>034cdf79588397ee92b27a0a217542fe39a6df27 | no | 441 |

**Warnings:**

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| **Information:** | | | | | |
| 2 | Non Patent Literature | 47_86012_13212766_919937.pdf | 14507121<br>b2ac10fcd71cd84cff96bb924fb2a4750e945ac2 | no | 361 |
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| 3 | Non Patent Literature | 48_86012_13212723_919939.pdf | 17594957<br>e17dde31aabfe427d0e9c070c8e89ff007c07d53 | no | 400 |
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| 4 | Non Patent Literature | 49_86012_12364819_919957_Part0.pdf | 23513805<br>7f8968461ca4a6b29943703050632c7730615a3a | no | 603 |
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| 5 | Non Patent Literature | 49_86012_12364819_919957_Part1.pdf | 1264805<br>bdaa750abf834f03f008b4df554785e6200b86e8 | no | 32 |
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| 6 | Non Patent Literature | 4_163087_11055310_919953.pdf | 623119<br>f88d166b18628894caca27640170816d2364e54f | no | 15 |
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| 7 | Non Patent Literature | 50_86012_13775435_919952.pdf | 11787710<br>da33fe015dddb4eebc3d59f6817402a566f7d24e | no | 283 |
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| 8 | Non Patent Literature | 51_86012_13744457_919959.pdf | 16533728<br>e2acb43bf05f965638aca32878e2e1652011d3d3 | no | 440 |
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| 9 | Non Patent Literature | 52_9161164_919951.pdf | 10342050<br>56c82c9a16672ab0be61b9ae3343302519db12e7 | no | 234 |
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| 10 | Non Patent Literature | 53_8090359_919931.pdf | 14096838<br>e9ccdc0e386adb71c4e799022b360d50825e1380 | no | 379 |
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| 11 | Non Patent Literature | 54_P2PPaid_919752.pdf | 1775856<br>ec31d1951ec0b214f424c37257ec3870d32e2d47 | no | 10 |
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| 12 | Non Patent Literature | 55_On_the_Potentia_919757.pdf | 1993985<br>2adf00c67b1ba378e524f11f1d3a1d77c2742856 | no | 17 |
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| 13 | Non Patent Literature | 56_Positioning_wit_919726.pdf | 786598<br>0f48810d44877dc7c766f113979074feffed487d | no | 5 |
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| 14 | Non Patent Literature | 57_EX1003_Declarat_919902_Part0.pdf | 23316645<br>db4a8a20cc88507de1c8bdac0ee222d1b496d31c | no | 58 |
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| 15 | Non Patent Literature | 57_EX1003_Declarat_919902_Part1.pdf | 23280590<br>a5442c609d55935fbbd110c94e6e9c9093eebad9 | no | 58 |
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| 16 | Non Patent Literature | 57_EX1003_Declarat_919902_Part2.pdf | 13442740<br>98de1103b7d1864cdbb1645fd1d206a65af21b8d | no | 30 |
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| 17 | Non Patent Literature | 58_Bridging_Physic_919720.pdf | 244663<br>2356c01e02cd12a2b28f68db56665c3115063df3 | no | 2 |
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| 18 | Non Patent Literature | 59_Assisted_Indoor_919732.pdf | 2148357<br>8771f63d9601299b3a07011f345e55ddda71c183 | no | 20 |
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| 19 | Non Patent Literature | 5_A_Fusion_919728.pdf | 976847<br>aca8b7a95456c45248bbf60ba3cf83a4729e1b14 | no | 5 |
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| 20 | Non Patent Literature | 60_SMart_Phone_919754.pdf | 1837911<br>25c36877aa01b9426884 6529b8e898a97e9f2e97 | no | 12 |
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| 21 | Non Patent Literature | 61_WO2018129109ISR_919967.pdf | 715853<br>66f27bc2597534f75a8e59cab7bec3be98e39601 | no | 14 |
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| 22 | Non Patent Literature | 62_Enhancements_to_919909.pdf | 1014506<br>0983b31cf8f59314bbf6abe032489a2805733c85 | no | 6 |
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| 23 | Non Patent Literature | 63_A_giant_of_a_919910.pdf | 647457<br>ef68e22956fe01fd8016b3a9a3a1e44f1e30f73d | no | 3 |
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| 24 | Non Patent Literature | 64_Ex_1003_Declara_919940.pdf | 1494827<br>61933feb7d949c38ec3a84a54a9a291165c4d081 | no | 140 |
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| 25 | Non Patent Literature | 65_Pages_from_1681_919826.pdf | 723197<br>29701e7bca054d45b15b38483cc0763e608b550e | no | 6 |
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| 26 | Non Patent Literature | 66_sddsdsdsd_919836.pdf | 443965<br>e724ec1db629a4098ee2cc1080ea967a6720c635 | no | 6 |
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| 27 | Non Patent Literature | 67_Pages_from_1681_919844.pdf | 277444<br>9c8d6dfd29ddb6e504999f0c9992a83bf0349cc2 | no | 6 |
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| 28 | Non Patent Literature | 68_Pages_from_1681_919852.pdf | 277427<br>71ea02efd0403e5612220114f7c37c0544cee2bb | no | 6 |
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| 29 | Non Patent Literature | 69_Pages_from_1681_919861.pdf | 277499<br>bac20d879c45d627866a61c24f457c6921a2d34c | no | 6 |
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| 30 | Non Patent Literature | 6_RADAR_919729.pdf | 2068153<br>b1614efc24e871e87358df5b82fd850538afa6dd | no | 10 |
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| 31 | Non Patent Literature | 70_Pages_from_1681_919869.pdf | 2588850<br>9938911f068c2481b29bc37ef36b8f3d6a164ad8 | no | 28 |
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| 32 | Non Patent Literature | 71_EX1003Declarati_919877_Part0.pdf | 23422493<br>582ac52a732c6619971b7548e53ab69798979c31 | no | 66 |
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| 33 | Non Patent Literature | 71_EX1003Declarati_919877_Part1.pdf | 23417110<br>7750f069b51f8eb403aa1957bc01229b6713072c | no | 66 |
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| 34 | Non Patent Literature | 71_EX1003Declarati_919877_Part2.pdf | 254453<br>2579b53169ffd824d0579a2984ecf444049568ff | no | 1 |
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| 35 | Non Patent Literature | 72_Pages_from_1681_919884.pdf | 2587545<br>85a2192c3b675de144d9355666f61a41f18b4169 | no | 28 |
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| 36 | Non Patent Literature | 73_Pages_from_1681_919891.pdf | 2589937<br>8e8205ba6db3ddd71cac9330da5bce6e1e7d6bef | no | 28 |
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| 37 | Non Patent Literature | 74_Pages_from_1681_919898.pdf | 2589323<br>1ad88c062647f2a1d752c172261ee64a2d2d462e | no | 28 |
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| **Information:** | | | | | |
| 38 | Non Patent Literature | 75_EX1003Declarati_919870.pdf | 1950674<br>41416f14628a49caa85d711dff612b75cfa3c9ac | no | 151 |
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| 39 | Non Patent Literature | 76_Pages_from_1681_919885.pdf | 5287982<br>976ffc4f6ed413dea2d49f9603b72025e9f4c9aa | no | 47 |
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| 40 | Non Patent Literature | 77_Pages_from_1681_919892.pdf | 5290578<br>d8de38c193aa32e8f6680eef6b318b8a66c10d39 | no | 47 |
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| 41 | Non Patent Literature | 78_aaaaaasssss_919899.pdf | 723434<br>dd56b3625f037591bf7fba7e9639d9752f842b4a | no | 6 |
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| 42 | Non Patent Literature | 79_Pages_from_1681_919878.pdf | 5288276<br>1a9d2eebdc449442c713b7dc857d6f92a94464e2 | no | 47 |
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| 43 | Non Patent Literature | 7_LowCost_919741.pdf | 776728<br>54819e69d7299f6f2174986661591158cd81aa3 | no | 4 |
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| 44 | Non Patent Literature | 80_PeertoPeer_919753.pdf | 532968<br>0622aa1baed0529e7825e8035811ba0601061667 | no | 9 |
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| 45 | Non Patent Literature | 81_InBuilding_919742.pdf | 971196<br>f9abb0722074f1c35f0f6baa37bd36079d715fc6 | no | 5 |
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| 46 | Non Patent Literature | 82_EX1003_Declarat_919747_Part0.pdf | 23316645<br>d973311597f4663a1b50443833233587e0c802dc | no | 58 |
| **Warnings:** | | | | | |
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| 47 | Non Patent Literature | 82_EX1003_Declarat_919747_Part1.pdf | 23280590<br>60029e79926f387da35bed26ce663b680c8a1a73 | no | 58 |
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| 48 | Non Patent Literature | 82_EX1003_Declarat_919747_Part2.pdf | 13442740<br>2869e1b3642ba9b116c5cdd918efdb184c8cbeb0 | no | 30 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 49 | Non Patent Literature | 83_ContextAware_919719.pdf | 1125824<br>be48046c2e60176ad4c13a4a6bce07501585775d | no | 8 |
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| 50 | Non Patent Literature | 84_Place_Lab_919743.pdf | 2295516<br>ed546201525954baa61cfcd22026a4f6862b3256 | no | 20 |
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| 51 | Non Patent Literature | 85_qqqqqqqqqqqdddd_919903_Part0.pdf | 23434510<br>0821cf6c1bede7b2c0d3d084f9213bd0934f8f84 | no | 145 |
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| 52 | Non Patent Literature | 85_qqqqqqqqqqqdddd_919903_Part1.pdf | 16436607<br>7fb2df6ffef95285df1f3f0cc3a8b4d5ec5180e5 | no | 105 |
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| 53 | Non Patent Literature | 86_ECommerce_919758_Part0.pdf | 23434510<br>94f22b601ab19e1d2df9f62a71f0cc491a643a53 | no | 145 |
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| 54 | Non Patent Literature | 86_ECommerce_919758_Part1.pdf | 16436607<br>87b7ec31c7629ea9436fff13a8fb54b3a522f0d5 | no | 105 |
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| 55 | Non Patent Literature | 87_An_Agent_919749.pdf | 919124<br>abd3c6106b1aab443bae72444467e10acfef2920f | no | 17 |
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| 56 | Non Patent Literature | 88_Zero_919733.pdf | 3207613<br>b4701eaf9bf520b1cb57609ac5e8d6bd756412c8 | no | 14 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 57 | Non Patent Literature | 89_Survey_919727.pdf | 3539926<br>0dfb3fd61fad2f2cc60bf2f2630bf51a0fb94ff0 | no | 14 |
| **Warnings:** | | | | | |
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| 58 | Non Patent Literature | 8_Indoor_919724.pdf | 1277333<br>ddc904ca792da4bf1c8305e8ffeb834eb8bb2604 | no | 6 |
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| 59 | Non Patent Literature | 90_Tamper_Univer_919734.pdf | 12796051<br>33f418e29add71b507a5bd91a65ad5fd04e2c9b8 | no | 140 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 60 | Non Patent Literature | 91_qqqqqqqqqq_919735.pdf | 2655252<br>cab05676e39376ea69374a8b74547610612 61321 | no | 12 |
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| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 450536944 | |

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**National Stage of an International Application under 35 U.S.C. 371**

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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
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| PATENT APPLICATION FEE DETERMINATION RECORD<br>Substitute for Form PTO-875 | Application or Docket Number<br>15/271,410 | Filing Date<br>09/21/2016 | ☐ To be Mailed |
|---|---|---|---|

**ENTITY:** ☐ LARGE ☑ SMALL ☐ MICRO

## APPLICATION AS FILED - PART I

| FOR | (Column 1)<br>NUMBER FILED | (Column 2)<br>NUMBER EXTRA | | RATE ($) | FEE ($) |
|---|---|---|---|---|---|
| ☐ BASIC FEE<br>(37 CFR 1.16(a), (b), or (c)) | N/A | N/A | | N/A | |
| ☐ SEARCH FEE<br>(37 CFR 1.16(k), (i), or (m)) | N/A | N/A | | N/A | |
| ☐ EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q)) | N/A | N/A | | N/A | |
| TOTAL CLAIMS<br>(37 CFR 1.16(i)) | minus 20 = | * | | x $40 = | |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h)) | minus 3 = | * | | x $210 = | |
| ☐ 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 | |

## APPLICATION AS AMENDED - PART II

| | | (Column 1) | | (Column 2) | (Column 3) | | | |
|---|---|---|---|---|---|---|---|---|
| AMENDMENT | 09/14/2021 | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE ($) | ADDITIONAL FEE ($) |
| | Total<br>(37 CFR 1.16(i)) | * 29 | Minus | ** 30 | = 0 | | x $50 = | 0 |
| | Independent<br>(37 CFR 1.16(h)) | * 2 | Minus | *** 3 | = 0 | | x $240 = | 0 |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | |
| | | | | | | | TOTAL ADD'L FEE | 0 |

| | | (Column 1) | | (Column 2) | (Column 3) | | | |
|---|---|---|---|---|---|---|---|---|
| AMENDMENT | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE ($) | ADDITIONAL FEE ($) |
| | Total<br>(37 CFR 1.16(i)) | * | Minus | ** | = | | x $0 = | |
| | Independent<br>(37 CFR 1.16(h)) | * | Minus | *** | = | | x $0 = | |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | |
| | | | | | | | TOTAL ADD'L FEE | |

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|---|---|
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3. | OPAC |
| ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". | /BRIDGET C. MONROE/ |
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| The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1. | |

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| | |
|---|---|
| **EFS ID:** | 43760476 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 14-SEP-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 14:18:52 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

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| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Amendment/Argument after Patent Board Decision | 20210914_111054-0001U4C7_Amendment_after_Appeal_Decision.pdf | 116419<br>e8991818a8a40b4a46d2f174ac10145be8916868 | no | 12 |

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**New International Application Filed with the USPTO as a Receiving Office**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of:<br>James A. Proctor, Jr., et al. | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

**AMENDMENT AFTER DECISION ON APPEAL**
**PURSUANT TO MPEP 1214.07 AND 37 CFR 41.33(c)**

Appellant hereby submits this Amendment after the Decision on Appeal dated August 17, 2021.

**Amendments to the Claims** begin on page 2.

**Remarks** begin on page 11.

**Amendments to the Claims**

The following listing replaces all prior versions of the claims:

1. (Currently Amended). A mobile wireless device comprising:

a first radio;

a second radio;

one or more processors;

one or more **[[non-transitory]]** memory devices coupled to the one or more processors, the one or more **[[non-transitory]]** memory devices storing a set of instructions that when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers;

receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions when the device is located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier , and a proximity beacon service identifier (PBSI);

determining if a particular short range transmission of the plurality of short range transmissions a) includes a MAC address, and b) includes the proximity beacon service identifier (PBSI) and if c) the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service;

then:

determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier.

2. (Previously Presented). The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching a format of a Bluetooth BD_ADDR.

3. (Cancelled).

4. (Previously Presented). The mobile wireless device of claim 1 wherein the one or more processors further execute the instructions to perform operations including:

receiving, by the second radio, a first proximity beacon transmission including a first MAC address and a first unique identifier at a first time; and

receiving, by the second radio, a second proximity beacon transmission including a second MAC address and a second unique identifier at a second time, the second MAC address being different from the first MAC address and the second unique identifier being different from the first unique identifier; and

associating the first and second unique identifier with a single beacon transmitter device.

5-7. (Cancelled).

8. (Previously Presented). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform operations including:

further determining that at least one beacon transmitter device associated with the beacon service is in proximity to the mobile wireless device, by utilizing an action function including one or more previously downloaded unique identifiers.

9-11. (Cancelled).

12. (Previously Presented). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform operations including

determining, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a predetermined location.

13. (Previously Presented). The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless device, and the one or more processors further execute the instructions to perform operations including:

sending of the unique identifier by the mobile wireless device to at least one server of the one or more servers; and

in response to the sending of the unique identifier, downloading the application software.

14. (Cancelled)

15. (Previously Presented). The mobile wireless device of Claim 4 wherein

the identifier related information comprises a list of contact information, and the one or more processors further execute the instructions to perform operations including:

further determining that at least one beacon transmitter device associated with the beacon service is further matched with an entity included within the list of contact information based upon comparing a contact identifier information with at least the portion of the unique identifier, and

the mobile wireless device, upon determining there is a match, allowing further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio.

16. (Cancelled).

17. (Previously Presented). The mobile wireless device of claim 1 wherein the one or more processors further execute the instructions to perform operations including:

receiving, via a second radio, the plurality of proximity beacon transmissions further includes receiving a first unique identifier at a first time that is different from a second unique identifier received at a second time; and

associating the first and second unique identifier with a single beacon transmitter device.

18-30. (Cancelled).

31. (Previously Presented). A method for facilitating use of proximity beacons, the method executing within a mobile device, and the method comprising:

communicating between the mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;

receiving, at the mobile device using a second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions from one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier (UID), and a proximity beacon service identifier (PBSI);

a) determining that a particular short range transmission of the plurality of short range transmissions includes a MAC address,

b) determining that the proximity beacon service identifier (PBSI) is present, and

c) determining that the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service; and

when the three determining steps a) b) and c) are each true, then d) determining that an entity or object associated with the proximity beacon service is within proximity to the mobile device, by utilizing the identifier related information and the unique identifier.

32-34. (Cancelled).

35. (Previously Presented). The method of claim 31,

wherein a first one of the plurality of proximity beacon transmissions received at a first time includes a first unique identifier, and wherein a second one of the plurality of proximity beacon transmissions received at a second time includes a second unique identifier the second unique identifier being different from the first unique identifier; and

associating both the first unique identifier and the second unique identifier with a particular entity or object in proximity to the mobile device.

36-40. (Cancelled).

41. (Previously Presented). The method of claim 31 wherein the MAC address is selected from a group consisting of (a) a randomly generated 48 bit number matching a format of a MAC address and (b) a Bluetooth BD_ADDR.

42. (Previously Presented). The method of claim 31

wherein a first one of the plurality of proximity beacon transmissions is received at a first time and includes a first unique identifier and first MAC address, and the Proximity beacon Service Identifier (PBSI), and

wherein a second one of the plurality of proximity beacon transmissions received at a second time includes a second unique identifier different from the first unique identifier and a second MAC address different from the first MAC address, and the proximity beacon service identifier; and

associating both the first unique identifier and the second unique identifier with the same entity or object in proximity to the mobile device.

43. (Cancelled).

44. (Previously Presented). The method of Claim 31, further comprising

preventing the sending of the unique identifier, using the first radio, to the one or more servers, based upon previous detections of the respective unique identifier associated with the proximity beacon transmission.

45. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and

receiving further information relating to an object or entity associated with being within proximity to the mobile device.

46. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

preventing the sending of the unique identifier, using the first radio, to the one or more servers, based upon previous detections of the respective unique identifier associated with the proximity beacon transmission.

47. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

controlling further communications between the mobile device and at least one device or server associated with an entity or object in proximity to the mobile device.

48. (Previously Presented). The method of Claim 31, further comprising:

receiving, using the first radio, access code information by the mobile device from at least one of the servers; and

utilizing the access code information to gain access to the entity or object determined to be in proximity to the mobile device.

49. (Previously Presented). The method of Claim 31, wherein receiving the identifier related information, using the first radio, is performed in response to sending at least the unique identifier to at least one of the one or more servers using the first radio.

50. (Previously Presented). The method of Claim 31, additionally comprising:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and

receiving further information relating to an object or entity associated with being within proximity to the mobile device.

51. (Previously Presented). The method of Claim 50, wherein the further information relates to one or more of the following:

a loyalty program;

a payment service; or

a coupon relating to an entity in proximity to the mobile device; or

advertising content.

52. (Previously Presented). The method of Claim 50, wherein the further information relates to a service for providing a menu for use by a user of the mobile device for use in purchasing items, and further comprising:

allowing for the user take delivery at or near the location of a fixed proximity beacon device.

53. (Previously Presented). The method of Claim 50, wherein the further information relates to a nearby user of an application on another device, in common with an application on the mobile device.

54. (Previously Presented). The method of Claim 53, wherein the application is a multiuser game.

55. (Previously Presented). The method of Claim 31, additionally comprising:

controlling further communications between the mobile device and at least one device or server associated with an entity or object in proximity to the mobile device.

56. (Previously Presented). The method of Claim 31, wherein the step of determining that an entity or object is within proximity further comprises:

comparing the identifier related information with the unique identifier or information derived from the unique identifier.

57. (Previously Presented). The method of Claim 31, additionally comprising:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and wherein the one or more servers perform the following steps:

associating an object or entity as being within proximity to the mobile device;

storing a user's purchasing practices or requests from the one or more servers, related to the associated object or entity information as stored proximity user behavior;

retrieving a stored user email address associated with an account associated with the mobile device; and

sending an email, addressed to the user email address containing customized content based upon the stored proximity user behavior.

58. (Previously Presented). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform the operations for determining that an entity or object is within proximity by further:

comparing the identifier related information with the unique identifier or information derived from the unique identifier.

59. (Previously Presented). The mobile wireless device of Claim 1, wherein the receiving of the identifier related information, using the first radio, is performed in response to the one or more processors executing instructions for:

sending at least the unique identifier to at least one of the one or more servers using the first radio.

60. (Previously Presented). The method of Claim 31, wherein the proximity beacon transmissions are received, at the mobile device, without requiring the mobile device to first

perform a step of transmitting to the one or more beacon transmitter devices from which the plurality of proximity beacon transmissions are received.

**Remarks**

The Applicant respectfully requests entry of the foregoing amendments to claim 1.

The amendments are considered to be timely and appropriate as they would revise all remaining rejected claims to be consistent with the Patent Trial and Appeal Board's Decision on Appeal mailed August 17, 2020 (the "PTAB's Decision").

Applicant notes that per MPEP 1214.07, such an Amendment is appropriate and authorized after a Decision on Appeal if the Amendment obviously places an application in condition for allowance, with the recommendation of the primary examiner and concurrence of the supervisory patent examiner. *See also* MPEP 1002.02(d) and 37 CFR 41.33(c).

In the present case, the PTAB's decision reversed the final rejection of claims 31,35, 41, 42, 44-57 and 60 under 35 USC 112 for lack of written description and indefiniteness. Therefore claims 31, 35, 41, 42, 44-57 and 60 are already in condition for allowance as they currently stand.

The PTAB's Decision affirmed the Examiner's final rejection under 35 USC 112 of claims 1, 2, 4, 8, 12, 13, 15, 17, 58 and 59 for lack of written description. The sole basis for that decision was lack of support for the claimed "non-transitory" memory as recited in independent claim 1. Page 6 of the PTAB's decision did find, however that:

> In regard to claim 1, the Specification discloses, "Memory provides volatile storage for computer software instructions and data used to implement an embodiment of the present invention (e.g., applications programs and the like)."

referring to page 10 the application. In other words, the PTAB Decision indicates there is support in the specification for a "memory" (albeit just not a "non-transitory" memory).

The instant amendment submitted herewith removes the "non-transitory" modifier from the recitation of the "memory" in claim 1. Thus claim 1, as now amended, and all claims that depend from it should be allowable and consistent with the PTAB's decision.

Previously withdrawn claim 43 is cancelled.

**Conclusion**

With entry of the foregoing amendments, all of the claims presented should be in condition for allowance.

The Examiner is invited to contact the undersigned attorney by telephone if such a call would help resolve any remaining concerns.

September 14, 2021

Respectfully submitted,

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor, Jr. |
| Art Unit | 3685 |
| Examiner Name | Maria Cristi Owen Sherr |
| Attorney Docket Number | 111054-0001U4C7 |

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor, Jr. |
| | Art Unit | 3685 |
| | Examiner Name | Maria Cristi Owen Sherr |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | |
|---|---|---|
| | 1 | Final Written Decision per 35 U.S.C. 138 dated November 8, 2021, IPR2020-00903, Patent 9,038,129 B2, Target Corporation v. Proxicom Wireless, L.L.C. (41 pages) |
| | 2 | Final Written Decision per 35 U.S.C. 138 dated November 8, 2021, IPR2020-00904, Patent 7,936,736 B2, Target Corporation v. Proxicom Wireless, L.L.C. (48 pages) |
| | 3 | Final Written Decision per 35 U.S.C. 138 dated November 8, 2021, IPR2020-00933, Patent 8,374,592 B2, Target Corporation v. Proxicom Wireless, L.L.C. (38 pages) |
| | 4 | Final Written Decision per 35 U.S.C. 138 dated November 8, 2021, IPR2020-00931, Patent 8,090,359 B2, Target Corporation v. Proxicom Wireless, L.L.C. (51 pages) |
| | 5 | Final Written Decision per 35 U.S.C. 138 dated November 8, 2021, IPR2020-00932, Patent 8,090,359 B2, Target Corporation v. Proxicom Wireless, L.L.C. (40 pages) |
| | 6 | Final Written Decision per 35 U.S.C. 138 dated November 30, 2021, IPR2020-00977, Patent 8,369,842 B2, Target Corporation v. Proxicom Wireless, L.L.C. (45 pages) |
| | 7 | Final Written Decision per 35 U.S.C. 138 dated November 30, 2021, IPR2020-00979, Patent 9,161,142 B2, Target Corporation v. Proxicom Wireless, L.L.C. (51 pages) |
| | 8 | Final Written Decision per 35 U.S.C. 138 dated November 30, 2021, IPR2020-00980, Patent 8,385,913 B2, Target Corporation v. Proxicom Wireless, L.L.C. (47 pages) |
| | 9 | Final Written Decision per 35 U.S.C. 138 dated November 30, 2021, IPR2020-00934, Patent 8,385,896 B2, Target Corporation v. Proxicom Wireless, L.L.C. (55 pages) |

If you wish to add additional non-patent literature document citation information please click the Add button Add

**EXAMINER SIGNATURE**

| Examiner Signature | | Date Considered | |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor, Jr. |
| Art Unit | 3685 |
| Examiner Name | Maria Cristi Owen Sherr |
| Attorney Docket Number | 111054-0001U4C7 |

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor, Jr. |
| Art Unit | 3685 |
| Examiner Name | Maria Cristi Owen Sherr |
| Attorney Docket Number | 111054-0001U4C7 |

## CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

## SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David J Thibodeau Jr Reg No 31671/ | Date (YYYY-MM-DD) | 2021-12-01 |
| Name/Print | David J. Thibodeau, Jr. | Registration Number | 31,671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

# 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 the Freedom of Information Act requires disclosure of these record s.

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 inspections 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.

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 44408599 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 01-DEC-2021 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 14:31:31 |
| **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 | Information Disclosure Statement (IDS) Form (SB08) | 20211201_111054-0001U4C7_TPO_SIDS_Final_IPR_Decisions.pdf | 612244<br>5681cd8bf9755f30c90d3b1011d8a44547e6b6f9 | no | 5 |

**Warnings:**

| Information: | | | | | |
|---|---|---|---|---|---|
| A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems. | | | | | |
| 2 | Non Patent Literature | IPR2020-00980_Final_Written_Decision.pdf | 418834<br>edff67824c87df421b88b890d2d3d5cc7c838f69 | no | 47 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Non Patent Literature | IPR2020-00979_Final_Written_Decision.pdf | 436569<br>66362ead125c406c01b501d2da82288601ee4340 | no | 51 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Non Patent Literature | IPR2020-00977_Final_Written_Decision.pdf | 419199<br>9ff62ca4fb94c1d2d5ffb9016c993b4f5266bea2 | no | 45 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Non Patent Literature | IPR2020-00934_Final_Written_Decision.pdf | 529390<br>078a689f4e74b2a419f2011efb0982f22d4c44b5 | no | 55 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Non Patent Literature | IPR2020-00903_Final_Written_Decision.pdf | 1796550<br>7d87157b29951cfe1b0ce47fe53aa432ebb08d8e | no | 41 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 7 | Non Patent Literature | IPR2020-00904_Final_Written_Decision.pdf | 2108538<br>90ada6a6eaf3d16db03d78effc9fc4106e12570e | no | 48 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

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|---|---|---|---|---|---|
| 8 | Non Patent Literature | IPR2020-00931_Final_Written_Decision.pdf | 2039402<br>728a793da0a66241f9ca6476692b9c56406db103 | no | 51 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 9 | Non Patent Literature | IPR2020-00932_Final_Written_Decision.pdf | 1624777<br>0d70173bcad057d3dc4d2cc74d946df884227ec1 | no | 40 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Non Patent Literature | IPR2020-00933_Final_Written_Decision.pdf | 1524205<br>a228ca4cd2199836bd787e6c77570e4a1783ccfc | no | 38 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 11509708 | | |

**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
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www.uspto.gov

# NOTICE OF ALLOWANCE AND FEE(S) DUE

86012 7590 12/02/2021

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

DATE MAILED: 12/02/2021

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

TITLE OF INVENTION: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $600 | $0.00 | $0.00 | $600 | 03/02/2022 |

**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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

86012 7590 12/02/2021

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

| |
|---|
| (Typed or printed name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

TITLE OF INVENTION: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $600 | $0.00 | $0.00 | $600 | 03/02/2022 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| SHERR, MARIA CRISTI OWEN | 3685 | 705-050000 |

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 03-09 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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 _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 12/02/2021

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER | |
|---|---|
| SHERR, MARIA CRISTI OWEN | |
| ART UNIT | PAPER NUMBER |
| 3685 | |

DATE MAILED: 12/02/2021

**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.

## 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 30 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. 15/271,410 | Applicant(s) Proctor et al. | |
|---|---|---|---|
| | Examiner CRISTINA O SHERR | Art Unit 3685 | AIA (FITF) 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 See Continuation Sheet.
   ☐ 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 See Continuation Sheet . 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 See Continuation Sheet.
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 _____.

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

Continuation of 1. This communication is responsive to: Decision of The Patent Trial and Appeal Board, issued August 17, 2021, and the Applicant's Amendment filed September 14, 2021.

Continuation of 3. The allowed claim(s) is/are: 1-2,4,8,12-13,15,17,31,35,41-42 and 44-60

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: August 23, 2021 --- four (4) such statements

## DETAILED ACTION

### *Notice of Pre-AIA or AIA Status*

1. The present application is being examined under the pre-AIA first to invent provisions. This Office Action is in response to the Decision of The Patent Trial and Appeal Board, issued August 17, 2021, and the Applicant's Amendment filed September 14, 2021.

2. Claims 1-2, 4, 8, 12-13, 15, 17, 31, 35, 41-42, and 44-60 are pending in this case. Claim 1 is currently amended.

### *Information Disclosure Statement*

3. The information disclosure statements (IDS) submitted on August 23, 2021 --- four (4) such statements – are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### *Reasons for Allowance*

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

5. The present claims are drawn to facilitating the exchange of information and transactions between two entities associated with two wireless devices when the devices are in close proximity to each other utilizing both a short range and a long range wireless capability.

6. The closest prior art of record, Sundar et al (US 2003/0134650), discloses a mobile wireless device (abs) comprising:

a first radio; (par 59-60)

a second radio; (par 55-58, 65)

one or more processors: (par 59-65)

one or more memory devices coupled to the one or more processors, (par 59-65) the one or more memory devices storing a set of instructions that, when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers; (par 59-60)

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers; (par 59-60)

receiving, using the second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions when the device is located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a proximity beacon service identifier (PBSI); (par 55-58, 65)

determining if a particular short range transmission of the plurality of short range transmissions includes the proximity beacon service identifier (PBSI) and if c) the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service: (par 58-59, 65)

determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information. (par 58-59, 65)

7. However, the prior art does not disclose each of the proximity beacon transmissions including a MAC address and a unique identifier, determining if a particular short range transmission of the plurality of short range transmissions includes a MAC address, and utilizing the unique identifier.

8. For these reasons, independent claims 1 and 31, and their dependent claims 2, 4, 8, 12-13, 15, 17, 35, 41-42, and 44-60 are deemed allowable.

***Conclusion***

9. 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.”

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRISTINA OWEN SHERR whose telephone number is (571)272-6711. The examiner can normally be reached 8:30 - 5:30.

11. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W Hayes can be reached on 571-272-6708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

| Notice of References Cited | Application/Control No. 15/271,410 | Applicant(s)/Patent Under Reexamination Proctor et al. | |
|---|---|---|---|
| | Examiner CRISTINA O SHERR | Art Unit 3685 | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | CPC Classification | US Classification |
|---|---|---|---|---|---|---|
| * | A | US-20160025837-A1 | 01-2016 | Hillier; Peter M. | H04W4/023 | 342/386 |
| * | B | US-20130217332-A1 | 08-2013 | Altman; Steven R. | H04L43/10 | 455/41.2 |
| * | C | US-20030053484-A1 | 03-2003 | Sorenson, Donald C. | H04N21/6118 | 370/468 |
| * | D | US-20050114654-A1 | 05-2005 | Brackett, Charles Cameron | G16H30/20 | 713/161 |
| * | E | US-20050099291-A1 | 05-2005 | Landau, Steven | A61H3/061 | 340/539.13 |
| * | F | US-20060032901-A1 | 02-2006 | Sugiyama; Toshiharu | G07C9/27 | 235/375 |
| * | G | US-20030134650-A1 | 07-2003 | Sundar, Rangamani | H04L69/08 | 455/465 |
| * | H | US-20060104200-A1 | 05-2006 | Park; Jae-Hyun | H04W88/06 | 370/216 |
| | I | | | | | |
| | J | | | | | |
| | K | | | | | |
| | L | | | | | |
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**FOREIGN PATENT DOCUMENTS**

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Country | Name | CPC Classification |
|---|---|---|---|---|---|---|
| | N | | | | | |
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| | P | | | | | |
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**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.

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/271,410 | Proctor et al. |
| | Examiner | Art Unit |
| | CRISTINA O SHERR | 3685 |

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

**CLAIMS**

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

| CLAIM | | DATE | | | | | | | | |
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| 6 | 13 | = | | | | | | | | |
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| | 40 | - | | | | | | | | |
| 11 | 41 | = | | | | | | | | |
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| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/271,410 | Proctor et al. |
| | **Examiner** | **Art Unit** |
| | CRISTINA O SHERR | 3685 |

| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 11/19/2021 | | | | | | | | |
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| 28 | 59 | = | | | | | | | | |
| 29 | 60 | = | | | | | | | | |

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
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| | 15/271,410 | Proctor et al. |
| | **Examiner** | **Art Unit** |
| | CRISTINA O SHERR | 3685 |

| CPC | | | | | | |
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| **Symbol** | | | | | **Type** | **Version** |
| G06Q | / | 30 | / | 0261 | F | 2013-01-01 |
| H04W | / | 4 | / | 029 | I | 2018-02-01 |
| H04W | / | 4 | / | 21 | I | 2018-02-01 |
| H04W | / | 4 | / | 80 | I | 2018-02-01 |
| G06Q | / | 10 | / | 0875 | I | 2013-01-01 |
| G06Q | / | 20 | / | 202 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0207 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0222 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0226 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0242 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0282 | I | 2013-01-01 |
| G06Q | / | 30 | / | 0601 | I | 2013-01-01 |
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| H04L | / | 63 | / | 20 | I | 2013-01-01 |
| H04W | / | 8 | / | 005 | I | 2013-01-01 |
| H04W | / | 12 | / | 02 | I | 2013-01-01 |
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| H04L | / | 67 | / | 24 | I | 2013-01-01 |
| H04L | / | 67 | / | 306 | I | 2013-01-01 |
| H04L | / | 67 | / | 18 | I | 2013-01-01 |
| H04L | / | 69 | / | 18 | I | 2013-01-01 |
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| G06Q | / | 20 | / | 385 | I | 2013-01-01 |
| G06Q | / | 20 | / | 4016 | I | 2013-01-01 |
| G06Q | / | 50 | / | 01 | I | 2013-01-01 |
| H04W | / | 4 | / | 023 | I | 2013-01-01 |
| H04W | / | 88 | / | 06 | A | 2013-01-01 |

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|---|---|---|---|
| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685<br>(Assistant Examiner) | 19 November 2021<br>(Date) | **Total Claims Allowed:**<br>29 | |
| /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685<br>(Primary Examiner) | 19 November 2021<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>1 |

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
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| | 15/271,410 | Proctor et al. |
| | **Examiner** | **Art Unit** |
| | CRISTINA O SHERR | 3685 |

| CPC | | | | | | | |
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| **Symbol** | | | | | | **Type** | **Version** |
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| H04L | / | 61 | / | 6022 | | A | 2013-01-01 |

| CPC Combination Sets | | | | | | | | |
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| **Symbol** | | | | | **Type** | **Set** | **Ranking** | **Version** |
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| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685<br>(Assistant Examiner) | 19 November 2021<br>(Date) | **Total Claims Allowed:**<br>29 | |
|---|---|---|---|
| /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685<br>(Primary Examiner) | 19 November 2021<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>1 |

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/271,410 | Proctor et al. |
| | **Examiner** | **Art Unit** |
| | CRISTINA O SHERR | 3685 |

| INTERNATIONAL CLASSIFICATION | | | | |
|---|---|---|---|---|
| **CLAIMED** | | | | |
| H04W | / | 4 | / | 80 |
| H04W | / | 4 | / | 029 |
| | / | | / | |

| NON-CLAIMED | | | | |
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| US ORIGINAL CLASSIFICATION | |
|---|---|
| **CLASS** | **SUBCLASS** |
| 705 | 50 |

| CROSS REFERENCES(S) | | | | | | |
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| **CLASS** | **SUBCLASS (ONE SUBCLASS PER BLOCK)** | | | | | |
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| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685<br>(Assistant Examiner) | 19 November 2021<br>(Date) | **Total Claims Allowed:**<br>29 | |
|---|---|---|---|
| /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685<br>(Primary Examiner) | 19 November 2021<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>1 |

| Issue Classification | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/271,410 | Proctor et al. |
| | **Examiner** | **Art Unit** |
| | CRISTINA O SHERR | 3685 |

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

**CLAIMS**

| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
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| 2 | 2 | | 11 | | 20 | | 29 | | 38 | 16 | 47 | 25 | 56 | | |
| | 3 | 5 | 12 | | 21 | | 30 | | 39 | 17 | 48 | 26 | 57 | | |
| 3 | 4 | 6 | 13 | | 22 | 9 | 31 | | 40 | 18 | 49 | 27 | 58 | | |
| | 5 | | 14 | | 23 | | 32 | 11 | 41 | 19 | 50 | 28 | 59 | | |
| | 6 | 7 | 15 | | 24 | | 33 | 12 | 42 | 20 | 51 | 29 | 60 | | |
| | 7 | | 16 | | 25 | | 34 | | 43 | 21 | 52 | | | | |
| 4 | 8 | 8 | 17 | | 26 | 10 | 35 | 13 | 44 | 22 | 53 | | | | |
| | 9 | | 18 | | 27 | | 36 | 14 | 45 | 23 | 54 | | | | |

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|---|---|---|---|
| /Cristina Owen Sherr/<br>Examiner, Art Unit 3685<br>(Assistant Examiner) | 19 November 2021<br>(Date) | **Total Claims Allowed:**<br>29 | |
| /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685<br>(Primary Examiner) | 19 November 2021<br>(Date) | O.G. Print Claim(s)<br>1 | O.G. Print Figure<br>1 |

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 15/271,410 | Proctor et al. |
| | Examiner | Art Unit |
| | CRISTINA O SHERR | 3685 |

| CPC - Searched* | | |
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| Symbol | Date | Examiner |
| G06Q 30/0261 | 11/19/2021 | cos |
| H04W4/029 | 11/19/2021 | cos |

| CPC Combination Sets - Searched* | | |
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| Symbol | Date | Examiner |
| | | |

| US Classification - Searched* | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 705 | 50 | 11/19/2021 | cos |

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

| Search Notes | | |
|---|---|---|
| Search Notes | Date | Examiner |
| PE2E search | 11/19/2021 | cos |
| NPL search attached | 11/19/2021 | cos |
| Foreign patent search attached | 11/19/2021 | cos |

| Interference Search | | | |
|---|---|---|---|
| US Class/CPC Symbol | US Subclass/CPC Group | Date | Examiner |
| 705 | 50 | 11/19/2021 | cos |
| G06Q30 | 0261 | 11/19/2021 | cos |

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| /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 | /Cristina Owen Sherr/<br>Examiner, Art Unit 3685 |

# Search History15271410

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| 5 | 2021-11-18 19:46 UTC | 3059 | 4 |

**Content: Patent Publications (164)**

US Patents | US Designs | US Applications | EPO Patents | EPO Applications | China Patents | China Applications | Japan Patents | Japan Applications | Korea Patents | Korea Applications | WIPO Applications | Argentina Patents | Argentina Applications | Brazil Patents | Brazil Applications | Canada Patents | Canada Applications | Chile Patents | Chile Applications | Colombia Applications | Costa Rica Applications | Cuba Patents | Cuba Applications | Dominican Republic Applications | Ecuador Patents | Ecuador Applications | El Salvador Applications | Guatemala Applications | Honduras Applications | Mexico Patents | Mexico Applications | Nicaragua Patents | Panama Applications | Peru Applications | Trinidad & Tobago Patents | Uruguay Applications | Austria Patents | Austria Applications | Belarus Patents | Belgium Patents | Belgium Applications | Bosnia & Herzegovina Patents | Bosnia & Herzegovina Applications | Bulgaria Patents | Bulgaria Applications | Croatia Patents | Croatia Applications | Czech Republic Patents | Czech Republic Applications | Czechoslovakia Patents | Czechoslovakia Applications | Denmark Patents | Denmark Applications | Estonia Patents | Estonia Applications | EUIPO Patents | Finland Patents | Finland Applications | France Patents | France Applications | Germany Patents | Germany Applications | Great Britain Patents | Great Britain Applications | Greece Patents | Greece Applications | Hungary Patents | Hungary Applications | Iceland Patents | Iceland Applications | Ireland Patents | Ireland Applications | Italy Patents | Italy Applications | Latvia Patents | Latvia Applications | Lithuania Patents | Lithuania Applications | Luxembourg Patents | Malta Patents | Monaco Patents | Montenegro Patents | Montenegro Applications | Netherlands Patents | Netherlands Applications | Norway Patents | Norway Applications | Poland Patents | Poland Applications | Portugal Patents | Portugal Applications | Republic of Moldova Patents | Republic of Moldova Applications | Romania Patents | Romania Applications | San Marino Patents | San Marino Applications | Serbia Patents | Serbia Applications | Slovakia Patents | Slovakia Applications | Slovenia Patents | Spain Patents | Spain Applications | Sweden Patents | Sweden Applications | Switzerland Patents | Switzerland Applications | Ukraine Patents | Yugoslavia/Serbia and Montenegro Patents | Yugoslavia/Serbia and Montenegro Applications | Armenia Patents | Australia Patents | Australia Applications | Cyprus Patents | Gulf Cooperation Council Patents | Hong Kong Patents | India Patents | India Applications | Indonesia Patents | Indonesia Applications | Israel Applications | Jordan Patents | Kyrgyzstan Patents | Macao Applications | Malaysia Patents | Mongolia Patents | New Zealand Patents | Philippines Patents | Philippines Applications | Saudi Arabia Patents | Singapore Patents | Singapore Applications | Taiwan Patents | Taiwan Applications | Tajikistan Patents | Tajikistan Applications | Thailand Applications | Uzbekistan Patents | Vietnam Patents | Algeria Patents | ARIPO Patents | ARIPO Applications | Egypt Patents | Kenya Patents | Malawi Patents | Morocco Patents | Morocco Applications | OAPI Patents | South Africa Patents | Tunisia Applications | Zambia Patents | Zimbabwe Patents | EAPO Patents | EAPO Applications | Georgia Patents | Georgia Applications | Kazakhstan Patents | Kazakhstan Applications | Russia Patents | Russia Applications | Turkey Patents | Turkey Applications

1 **2021-11-18 19:44 UTC | ~35,921,889 results from**

**De-Dup:** Simple Family Numbers | **Cut-off:** None | **Sort:** Relevance

**Main Concept:** Document

US20170011425 Exchanging identifiers between wireless communication to determine further information to be exchanged or further services to be provided (view)

**Concept Modifiers:** None

**Filters:** None

2 **2021-11-18 19:45 UTC | ~112 results from**

**De-Dup:** Simple Family Numbers | **Cut-off:** 0.800 | **Sort:** Relevance

**Main Concept:** Same as Query 1

**Concept Modifiers:** None

**Filters:** None

**Content: Non-Patent Literature (23)**

IEEE Xplore Publications: IEEE Periodicals | IEEE Xplore Publications: IEEE Conferences | IEEE Xplore Publications: IEEE Standards | IEEE Xplore Publications: IEEE Early Access | IEEE Xplore Publications: SMPTE Periodicals | IEEE Xplore Publications: SMPTE Conferences | IEEE Xplore Publications: SMPTE Standards | IEEE Xplore Publications: MIT Press eBooks | IEEE Xplore Publications: Wiley-IEEE eBooks | IEEE Xplore Publications: IBM Periodicals | IEEE Xplore Publications: URSI Periodicals | IEEE Xplore Publications: VDE Conferences | IEEE Xplore Publications: Periodicals from China | IP.com Prior Art Database: The IP.com Journal | IP.com Prior Art Database: Internet Society RFC | IP.com Prior Art Database: IBM TDB Archive | IP.com Prior Art Database: Legacy Journals | IP.com Prior Art Database: Software Patent Institute | OnePetro.org: Periodicals at OnePetro.org | OnePetro.org: Conferences at OnePetro.org | Other Literature: IBM Redbooks | Other Literature: PubMed Central | Other Literature: arXiv.org

3 **2021-11-18 19:45 UTC | 6,525,935 results from**

**De-Dup:** None | **Cut-off:** None | **Sort:** Relevance

**Main Concept:** Document

US20170011425 Exchanging identifiers between wireless communication to determine further information to be exchanged or further services to be provided (view)

**Concept Modifiers:** None

**Filters:** None

4 **2021-11-18 19:46 UTC | 0 results from**

**De-Dup:** None | **Cut-off:** 0.800 | **Sort:** Relevance

**Main Concept:** Same as Query 3

**Concept Modifiers:** None

**Filters:** None

5 **2021-11-18 19:46 UTC | 3059 results from**

**De-Dup:** None | **Cut-off:** 0.600 | **Sort:** Relevance

**Main Concept:** Same as Query 3

**Concept Modifiers:** None

**Filters:** None

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| | | | |
|---|---|---|---|
| | 1 | File History for U.S. Patent 9,038,129 | |
| | 2 | File History for U.S. Patent 9,161,164 | |
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| | 14 | Joint Claim Construction Statement filed May 22, 2020 with the United States District Court, Middle District of Florida, Orlando Division | |
| | 15 | Joint Claim Construction Statement, dated June 15, 2020; Case No. IPR2020-00934, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
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| | 21 | Joint Claim Construction Statement, dated May 22, 2020; Case No. IPR2020-00904, Target Corporation vs. Proxicom Nireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 22 | Joint Claim Construction Statement, dated May 22, 2020; Case No. IPR2020-00931, Target Corporation vs. Proxicom Nireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |



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|---|---|---|---|
| | 23 | Joint Claim Construction Statement, dated May 22, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Nireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 24 | Joint Claim Construction Statement, dated May 22, 2020; Case No. IPR2020-00933, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 25 | Joint Claim Regarding Claim Construction Briefing Procedure, dated June 15, 2020; Case No. IPR2020-00903, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 26 | Joint Statement Regarding Claim Cnstruction Briefing Procedure, dated June 15, 2020; Case No. IPR2020-00931, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 27 | Joint Statement Regarding Claim Cnstruction Briefing Procedure, dated June 15, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 28 | Joint Statement Regarding Claim Cnstruction Briefing Procedure, dated June 15, 2020; Case No. IPR2020-00933, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 29 | Joint Statement Regarding Claim Construction Briefing Procedure, dated June 15, 2020; Case No. IPR2020-00904, arget Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
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| | Attorney Docket Number | 111054-0001U4C7 |

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**EXAMINER SIGNATURE**

| Examiner Signature | /Cristina Owen Sherr/ | Date Considered | 11/18/2021 |
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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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## PE2E SEARCH - Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | British Equivalents | Time Stamp |
|---|---|---|---|---|---|---|---|
| L1 | 1812 | (705/50).ccls. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:30 AM |
| L2 | 138477 | G06Q30/02$.cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:30 AM |
| L3 | 22116 | H04W4/2$.cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:31 AM |
| L4 | 158580 | L1 L2 L3 | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:31 AM |
| L5 | 70156 | (L1 L2 L3) AND radio | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L6 | 2979 | (L1 L2 L3) AND (radio SAME beacon) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L7 | 475 | (L1 L2 L3) AND (radio SAME beacon SAME proximity) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L8 | 61 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L9 | 0 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission SAME indentif$) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 12:02 PM |
| L10 | 22 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission SAME identif$) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 12:02 PM |
| L11 | 87 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission SAME identif$) | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 12:04 PM |
| L12 | 640055 | (L1 L2 L3) | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 12:05 PM |

## PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

PTO/SB/08a (02-18)
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| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| | 19 | Declaration of David Hilliard Williams in Support of Petition for Inter Partes Review of U.S. Patent 8,385,913 | |
| | 20 | Declaration of David Hilliard Williams in Support of Petition for Inter Partes Review of U.S. Patent 9,038,129 | |
| | 21 | Declaration of David Hilliard Williams in Support of Petition for Inter Partes Review of U.S. Patent 9,161,164 | |
| | 22 | Declaration of Sylvia Hall-Ellis, Ph.D in Support of Patent Owner's Preliminary Response; Case No. IPR2020-00979, Target Corporation vs. Proxicom Wireless, L.L.C.; pp. 1-66 | |
| | 23 | Defendant's Preliminary Constructions of Proposed Terms, dated May 14, 2020; Case No. IPR2020-00903, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |



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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | | |
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| | 24 | Defendant's Preliminary Constructions of Proposed Terms, dated May 14, 2020; Case No. IPR2020-00904, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 25 | Defendant's Preliminary Constructions of Proposed Terms, dated May 14, 2020; Case No. IPR2020-00931, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
| | 26 | Defendant's Preliminary Constructions of Proposed Terms, dated May 14, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-28 | |
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| | 33 | Defendant's Preliminary Constructions of Proposed Terms, dated May 8, 2020; Case No. IPR2020-00903, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-22 | |
| | 34 | Defendant's Preliminary Constructions of Proposed Terms, dated May 8, 2020; Case No. IPR2020-00904, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-22 | |



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| | 35 | Defendant's Preliminary Constructions of Proposed Terms, dated May 8, 2020; Case No. IPR2020-00931, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-22 | |
| | 36 | Defendant's Preliminary Constructions of Proposed Terms, dated May 8, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-22 | |
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| | 45 | File History for U.S. Patent 8,369,842 | |

EFS Web 2.1.18 CONSIDERED: /C.O.S/

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| | Attorney Docket Number | 111054-0001U4C7 |

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|---|---|---|
| | 46 | File History for U.S. Patent 8,370,955 |
| | 47 | File History for U.S. Patent 8,374,592 |
| | 48 | File History for U.S. Patent 8,385,896 |
| | 49 | File History for U.S. Patent 8,385,913 |
| | 50 | File History for U.S. Patent 8,849,698 |

If you wish to add additional non-patent literature document citation information please click the Add button Add

**EXAMINER SIGNATURE**

| Examiner Signature | /Cristina Owen Sherr/ | Date Considered | 11/18/2021 |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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| Filing Date | 2016-09-21 |
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| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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## PE2E SEARCH - Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | British Equivalents | Time Stamp |
|---|---|---|---|---|---|---|---|
| L1 | 1812 | (705/50).ccls. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:30 AM |
| L2 | 138477 | G06Q30/02$.cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:30 AM |
| L3 | 22116 | H04W4/2$.cpc. | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:31 AM |
| L4 | 158580 | L1 L2 L3 | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:31 AM |
| L5 | 70156 | (L1 L2 L3) AND radio | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L6 | 2979 | (L1 L2 L3) AND (radio SAME beacon) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L7 | 475 | (L1 L2 L3) AND (radio SAME beacon SAME proximity) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L8 | 61 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 11:50 AM |
| L9 | 0 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission SAME indentif$) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 12:02 PM |
| L10 | 22 | (L1 L2 L3) AND (radio SAME beacon SAME proximity SAME transmission SAME identif$) | (US-PGPUB; USPAT) | OR | ON | ON | 2021/11/19 12:02 PM |

## PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

# Bibliographic Data

Application No: 15/271,410

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /Cristina Owen Sherr/ Examiner's Signature | Initials

Title: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|---|---|---|---|
| 09/21/2016 | 705 | 3685 | 111054-0001U4C7 |
| RULE | | | |

**APPLICANTS**

Proxicom Wireless, LLC, Indialantic, FL, UNITED STATES

**INVENTORS**

James Arthur Proctor JR., Indialantic, FL, UNITED STATES

James Arthur Proctor III, Indialantic, FL, UNITED STATES

**CONTINUING DATA**

This application is a CON of 14861563 09/22/2015ABN

14861563 is a CON of 14472477 08/29/2014 PAT 9161164

14472477 is a CON of 13775435 02/25/2013 PAT 8849698

13775435 is a CON of 13212723 08/18/2011 PAT 8385896

13212723 is a CON of 12364828 02/03/2009 PAT 8090359

12364828 has PRO of 61095359 09/09/2008

12364828 has PRO of 61095001 09/08/2008

**FOREIGN APPLICATIONS**

**IF REQUIRED, FOREIGN LICENSE GRANTED****

09/30/2016

**** SMALL ENTITY ****

**STATE OR COUNTRY**

UNITED STATES

**ADDRESS**

VLP Law Group LLP

555 Bryant Street

Suite 820
Palo Alto, CA 94301
UNITED STATES

**FILING FEE RECEIVED**

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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| Attorney Docket Number | 111054-0001U4C7 |

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| | 2 | Patent Owner Proxicom Wireless, LLC's Preliminary Response Pursuant to 37 C.F.R. 42.107; dated 8/13/2020, Case No. IPR2020-00931, Target Corporation vs. Proxicom Wireless, L.L.C.; pp. 1-48 | |
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| | 6 | Patent Owner Proxicom Wireless, LLC's Preliminary Response Pursuant to 37 C.F.R. 42.107; dated 9/8/2020, Case No. IPR2020-00977, Target Corporation vs. Proxicom Wireless, L.L.C.; pp. 1-78 | |
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| | 9 | Patent Owner Proxicom Wireless, LLC's Preliminary Response Pursuant to 37 C.F.R. 42.107; dated 9/8/2020, Case No. IPR2020-00980, Target Corporation vs. Proxicom Wireless, L.L.C.; pp. 1-73 | |
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| | 13 | Petition for Inter Partes Review, dated 5/15/2020, Case No. IPR2020-00933, Target Corporation vs. Proxicom Wireless, L.L.C. | |
| | 14 | Petition for Inter Partes Review, dated 5/27/2020, Case No. IPR2020-00934, Target Corporation vs. Proxicom Wireless, L.L.C. | |
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| | 18 | Petition for Inter Partes Review, dated 6/1/2020, Case No. IPR2020-00978, Target Corporation vs. Proxicom Wireless, L.L.C. | |
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| | 32 | Symbol Technologies, Portable Shopping System: Integration Guide (2000); Wise Marketer Staff, Giant Foods Self-service Concept Store Opens (Oct. 12, 2005), https://thewisemarketer.com/headlines/giant-foods-self-service-concept-store-opens-4-2/ | |
| | 33 | Symbol Technologies, Wireless Networker LA-5033 PCT Adapter & LA-5030 PC Card, User Guide, pp. 1-72 (2004) | |



CONSIDERED: /C.O.S/

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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|---|---|---|---|
| | 34 | Target Corporation's Preliminary Invalidity Contentions dated March 16, 2020, filed in Proxicom Wireless LLC v. Target Corporation, U.S. District Court, Middle District of Florida, Orlando Division, C.A. No. 6:19-cv-1886-RBD-LRH | |
| | 35 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00903, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 36 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00904, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 37 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00931, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 38 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00932, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 39 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00933, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 40 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00934, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 41 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00977, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 42 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00978, Target corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 43 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00979, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |
| | 44 | Target's Initial Identification of Disputed Claim Terms; dated April 10, 2020; Case No. IPR2020-00980, Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 6:19-cv-1886-RBD-LRH; pp. 1-6 | |



CONSIDERED: /C.O.S/

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| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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|---|---|---|---|
| | 45 | Thongthammachart, S., et al., "Bluetooth enables in-door mobile location services," In Proceedings of the 57th IEEE Semiannual Vehicular Technology Conference: VTC2003 (Vol. 3, pp. Session 8H, paper 3) IEEE. | |
| | 46 | Transaction Receipt; PACER Service Center, dated August 6, 2020, pp. 1-3 | |
| | 47 | Transcript of Telephonic Motion Hearing, dated June 3, 2020; United States District Court, Middle District of Florida, Orlando Division; pp. 1-41; Case No. IPR2020-00903; Target Corporation vs. Proxicom Wireless, L.L.C.; C.A. No. 5:19-cv-1886-RBD-LRH; pp. 1-41 | |
| | 48 | Using Blouetooth, MC909X User Guide, Symbol Technologies, Inc., pp. 1-66 (2005) | |
| | 49 | Using MC9094 Phone, MC909X User Guide, Symbol Technologies, Inc., pp. 1-20 (2005) | |
| | 50 | Wang, F., et al., "Bridging Physical and Virtual Worlds: Complex Event Processing for RFID Data Streams," University of California, Los Angeles Computer Science Department, Springer-Verlag Berlin Heidelberg 2006, pp. 588-607 | |

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| Examiner Signature | /Cristina Owen Sherr/ | Date Considered | 11/18/2021 |
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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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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.

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# PE2E SEARCH - Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | British Equivalents | Time Stamp |
|---|---|---|---|---|---|---|---|
| L13 | 0 | (750/50).ccls. | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:06 PM |
| L14 | 3285 | (705/50).ccls. | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:06 PM |
| L15 | 545294 | (G06Q30/02$).cpc. | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:06 PM |
| L16 | 103145 | (H04W4/2$).cpc. | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:07 PM |
| L17 | 6777 | radio SAME beacon SAME proximity | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:08 PM |
| L18 | 1 | radio SAME beacon SAME proximity SAME tranmission | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:08 PM |
| L19 | 1714 | radio SAME beacon SAME proximity SAME transmission | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, | OR | ON | ON | 2021/11/19 03:08 PM |

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| | | | DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | | | | |
| L20 | 791 | radio SAME beacon SAME proximity SAME transmission SAME identif$ | (US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB) | OR | ON | ON | 2021/11/19 03:08 PM |

## PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

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|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| | | |
|---|---|---|
| | 1 | Want, R., et al., "Bridging Physical and Virtual Worlds with Electronic Tags," Xerox PARC, CHI '99 15-20 May 1999, PP- 370-377 |
| | 2 | WaveWorks Portable Shopping System Integration Guide, Integration Services Group, Pittsburgh, Pennsylvania, pp. 1-185 |
| | 3 | Wei, G., et al., "HiPEC: A Hybrid P2P Model for Electronic Commerce," Zhejiang Gongshang University College of Computer & Information Engineering, pp 1-5 (2008) |
| | 4 | Yang, H., et al., "Indoor Localization Systems - Tracking objects and personnel with sensors, wireless networks and RFID," Measurement+ Control, Vol. 42/1, Feb. 2009, pp. 18-23 |
| | 5 | Zhang, Y., et al., "Progress in WWW Research and Development," 1oth Asia-PacificWeb Conference, APWeb 2008, Shenyang, China, April 26-28, 2008 Proceedings, pp. 331-341 |
| | 6 | Zhou, Y., et al., "A Map Registration Localization Approach based on Mobile Beacons for Wireless Sensor Networks," Communications Research Centre Canada, 2011 Crown, 5 pp. |

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**EXAMINER SIGNATURE**

| Examiner Signature | /Cristina Owen Sherr/ | Date Considered | 11/18/2021 |
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|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2021-08-23 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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| | 2 | 20060268746 | A1 | 2006-11-30 | WIJTING et al. | |
| | 3 | 20080205340 | A1 | 2008-08-28 | MEYLAN et al. | |
| | 4 | 20150200811 | A1 | 2015-07-16 | KASSLIN et al. | |

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| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | | | | | | |

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**NON-PATENT LITERATURE DOCUMENTS** Remove

| Examiner Initials* | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T[5] |
|---|---|---|---|
| | 1 | Final Office Action received for U.S. Patent Application No. 17/366,826, mailed on Dec 13, 2021, 42 pages. | |

If you wish to add additional non-patent literature document citation information please click the Add button Add

**EXAMINER SIGNATURE**

| Examiner Signature | | Date Considered | |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

## CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

## SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2022-02-08 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

# 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 the Freedom of Information Act requires disclosure of these record s.

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 inspections or an issued patent.

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# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 44943154 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 08-FEB-2022 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 14:05:55 |
| **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 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_1.pdf | 1043756<br>64b1f0fa291223c34f2b5af0c41923fba652bf6c | no | 4 |

**Warnings:**

| Information: | | | | | |
|---|---|---|---|---|---|
| 2 | Non Patent Literature | 1_17366826_1_1041845.pdf | 1656980<br>36eafe2b01a1d7c38492aa10528f03f7c098afe0 | no | 42 |
| Warnings: | | | | | |
| Information: | | | | | |
| | | Total Files Size (in bytes): | 2700736 | | |

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**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.**

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

**U.S.PATENTS** Remove

| Examiner Initial* | Cite No | Patent Number | Kind Code[1] | Issue Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|---|---|---|---|---|---|---|
| | 1 | 8352323 | B2 | 2013-01-08 | Fisher Michelle | |

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**FOREIGN PATENT DOCUMENTS** Remove

| Examiner Initial* | Cite No | Foreign Document Number[3] | Country Code[2] i | Kind Code[4] | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T[5] |
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| | 1 | | | | | | | |

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| Examiner Initials* | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T[5] |
|---|---|---|---|

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | |
|---|---|---|
| | 1 | Non-Final Office Action received for U.S. Patent Application No. 14/861,563, mailed on May 09, 2016, 16 pages. |
| | 2 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Jun 09, 2020, 22 pages. |
| | 3 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Nov 24, 2020, 34 pages. |
| | 4 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Sep 03, 2020, 23 pages. |
| | 5 | Non-Final Office Action received for U.S. Patent Application No. 17/366,826, mailed on Aug 17, 2021, 40 pages. |
| | 6 | Notice of Allowance received for U.S. Patent Application No. 16/817,896, mailed on Jun 08, 2021, 17 pages. |
| | 7 | Notice of Allowance received for U.S. Patent Application No. 16/817,896, mailed on Jun 28, 2021, 4 pages. |
| | 8 | Notice of Allowance received for U.S. Patent Application No. 16/817,896, mailed on Mar 19, 2021, 17 pages. |

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**EXAMINER SIGNATURE**

| Examiner Signature | | Date Considered | |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

## SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2022-02-08 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

# Privacy Act Statement

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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).

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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.

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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.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of:<br>James Arthur Proctor, III | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

# TRANSMITTAL LETTER

In keeping with the duty of candor and good faith owed to the Patent and Trademark Office, Applicant wishes to bring to the Examiner's attention the reference listed on the accompanying form PTO/SB/08.

This submission is accompanied by the $130.00 fee set forth in 37 C.F.R. § 1.17(p).

Please charge any additional fee occasioned by this paper to our Deposit Account No. 50-4929.

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671/
David J. Thibodeau, Jr.
Reg. No. 31,671
VLP Law Group LLP

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| SUBMISSION- INFORMATION DISCLOSURE STMT | 2806 | 1 | 130 | 130 |
| | | **Total in USD ($)** | | **130** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 44943658 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 08-FEB-2022 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 19:10:41 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $130 |
| RAM confirmation Number | E202228J12322698 |
| 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 | Information Disclosure Statement (IDS) Form (SB08) | IDS_15271410_1.pdf | 1043784<br>ebf9ec8581a43a8be483474205529f79cd856356 | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Non Patent Literature | 1_14861563_1041801.pdf | 524348<br>fb7538a66c95af9bde599b8db0ddb4a30adc87e6 | no | 16 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Non Patent Literature | 2_137265_1041829.pdf | 870623<br>823acd4d3e097bf4688ee59d1aaea1ec1b91e931 | no | 22 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Non Patent Literature | 3_16817896_2_1041816.pdf | 1306167<br>d157c472ecf03534c4afc63a932de909e0cad587 | no | 34 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 5 | Non Patent Literature | 4_16817896_3_1041824.pdf | 907519<br>c7e8f170867e4af794589c7dcd0158ce2a207805 | no | 23 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 6 | Non Patent Literature | 5_17366826_1041837.pdf | 1524456<br>b7cd918bb47e2cfa35dd106769578070956c1268 | no | 40 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 7 | Non Patent Literature | 6_16817896_1041802.pdf | 801016<br>01ac1ba13b190efb033bf612e0652d07b62527ec | no | 17 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 8 | Non Patent Literature | 7_137230_1041825.pdf | 143545<br>535788952a58de4855ac1444c1a834cceaf5efc6 | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 9 | Non Patent Literature | 8_16817896_1_1041809.pdf | 1258761<br>e9157922abe57dfa8646c351555d60dc9bb5b2ec | no | 31 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 10 | Transmittal Letter | 20220208_111054-0001U4C7_TPO_SIDS_Transmittal.pdf | 72461<br>66e16a1cca492d6f166c6c09b0bda7460d6d3aef | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 11 | Fee Worksheet (SB06) | fee-info.pdf | 38239<br>d13b1c6174dfd51082752d50c55e73fe939180a6 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 8490919 | |

**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.**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

7590 02/15/2022

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER | |
|---|---|
| SHERR, MARIA CRISTI OWEN | |
| **ART UNIT** | **PAPER NUMBER** |
| 3685 | |
| **NOTIFICATION DATE** | **DELIVERY MODE** |
| 02/15/2022 | ELECTRONIC |

## NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

**U.S Patent 8352323 Fisher Michelle*

An Information Disclosure Statement (IDS) filed 02/08/2022 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☑ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

C. Garner, for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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 | 1 | 50 | 50 |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **50** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 45020541 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 17-FEB-2022 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 11:14:53 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

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| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $50 |
| RAM confirmation Number | E20222GB15294403 |
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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Amendment after Notice of Allowance (Rule 312) | 20220217_111054-0001U4C7_TPO_Amendment_After_Allowance.pdf | 113994<br>3c182e918aebfabda671e4c1c89253e7b7e21c5b | no | 12 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 38012<br>7bf289f80595b6af4a05064c4a50aae7575ef21 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 152006 | | |

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**New International Application Filed with the USPTO as a Receiving Office**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of:<br>James A. Proctor, Jr., et al. | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

## AMENDMENT AFTER ALLOWANCE

Appellant hereby submits this Amendment after Allowance pursuant to 37 CFR 1.312.

**Amendments to the Claims** begin on page 2.

**Remarks** begin on page 11.

**Amendments to the Claims**

The following listing replaces all prior versions of the claims:

1. (Currently Amended). A mobile wireless device comprising:

a first radio;

a second radio;

one or more processors;

one or more memory devices coupled to the one or more processors, the one or more memory devices storing a set of instructions that when executed by the one or more processors cause the one or more processors to perform operations including:

receiving, using the first radio, identifier related information associated with a proximity beacon service, from one or more servers;

receiving, using the second radio, a plurality of short range transmissions,-including a plurality of proximity beacon transmissions when the device is located within a detection range of one or more beacon transmitter devices associated with the proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier , and a ~~proximity~~ Proximity ~~beacon~~ Beacon ~~service~~ Service ~~identifier~~ Identifier (PBSI);

determining if a particular short range transmission of the plurality of short range transmissions a) includes a MAC address, and b) includes the proximity beacon service identifier (PBSI) and if c) the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service;

then:

determining if an entity or object associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing the identifier related information and the unique identifier.

2. (Previously Presented). The mobile wireless device of Claim 1, wherein the MAC address is a randomly generated 48 bit number matching a format of a Bluetooth BD_ADDR.

3. (Cancelled).

4. (Previously Presented). The mobile wireless device of claim 1 wherein the one or more processors further execute the instructions to perform operations including:

receiving, by the second radio, a first proximity beacon transmission including a first MAC address and a first unique identifier at a first time; and

receiving, by the second radio, a second proximity beacon transmission including a second MAC address and a second unique identifier at a second time, the second MAC address being different from the first MAC address and the second unique identifier being different from the first unique identifier; and

associating the first and second unique identifier with a single beacon transmitter device.

5-7. (Cancelled).

8. (Currently Amended). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform operations including:

further determining that at least one beacon transmitter device associated with the proximity beacon service is in proximity to the mobile wireless device, by utilizing an action function including one or more previously downloaded unique identifiers.

9-11. (Cancelled).

12. (Previously Presented). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform operations including

determining, based upon at least a portion of the identifier related information, that at least one beacon transmitter is a broadcast device having a predetermined location.

13. (Previously Presented). The mobile wireless device of Claim 1, wherein the identifier related information comprises application software for execution upon the mobile wireless

device, and the one or more processors further execute the instructions to perform operations including:

sending of the unique identifier by the mobile wireless device to at least one server of the one or more servers; and

in response to the sending of the unique identifier, downloading the application software.

14. (Cancelled)

15. (Currently Amended). The mobile wireless device of Claim 4 wherein

the identifier related information comprises a list of contact information, and

the one or more processors further execute the instructions to perform operations including:

further determining that at least one beacon transmitter device associated with the proximity beacon service is further matched with an entity included within the list of contact information based upon comparing a contact identifier information with at least ~~the~~ a portion of the unique identifier, and

the mobile wireless device, upon determining there is a match, allowing further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio.

16. (Cancelled).

17. (Previously Presented). The mobile wireless device of claim 1 wherein the one or more processors further execute the instructions to perform operations including:

receiving, via a second radio, the plurality of proximity beacon transmissions further includes receiving a first unique identifier at a first time that is different from a second unique identifier received at a second time; and

associating the first and second unique identifier with a single beacon transmitter device.

18-30. (Cancelled).

31. (Currently Amended). A method for facilitating use of proximity beacons, the method executing within a mobile device, and the method comprising:

communicating between the mobile device and one or more servers and receiving, at the mobile device, identifier related information, using a first radio;

receiving, at the mobile device using a second radio, a plurality of short range transmissions, including a plurality of proximity beacon transmissions from one or more beacon transmitter devices associated with ~~the~~ a proximity beacon service, each of the proximity beacon transmissions including a respective MAC address, a respective unique identifier (UID), and a ~~proximity~~ Proximity ~~beacon~~ Beacon ~~service~~ Service ~~identifier~~ Identifier (PBSI);

a) determining that a particular short range transmission of the plurality of short range transmissions includes a MAC address,

b) determining that the ~~proximity~~ Proximity ~~beacon~~ Beacon ~~service~~ Service ~~identifier~~ Identifier (PBSI) is present, and

c) determining that the PBSI indicates the particular short range transmission is a proximity beacon transmission associated with the proximity beacon service; and

when the three determining steps a) b) and c) are each true, then d) determining that an entity or object associated with the proximity beacon service is within proximity to the mobile device, by utilizing the identifier related information and the unique identifier.

32-34. (Cancelled).

35. (Previously Presented). The method of claim 31,

wherein a first one of the plurality of proximity beacon transmissions received at a first time includes a first unique identifier, and wherein a second one of the plurality of proximity beacon transmissions received at a second time includes a second unique identifier the second unique identifier being different from the first unique identifier; and

associating both the first unique identifier and the second unique identifier with a particular entity or object in proximity to the mobile device.

36-40. (Cancelled).

41. (Previously Presented). The method of claim 31 wherein the MAC address is selected from a group consisting of (a) a randomly generated 48 bit number matching a format of a MAC address and (b) a Bluetooth BD_ADDR.

42. (Currently Amended). The method of claim 31

wherein a first one of the plurality of proximity beacon transmissions is received at a first time and includes a first unique identifier and first MAC address, and the Proximity ~~beacon~~ Beacon Service Identifier (PBSI)~~,~~; and

wherein a second one of the plurality of proximity beacon transmissions received at a second time includes a second unique identifier different from the first unique identifier and a second MAC address different from the first MAC address, and the ~~proximity~~ Proximity ~~beacon~~ Beacon ~~service~~ Service ~~identifier~~Identifier (PBSI); and

associating both the first unique identifier and the second unique identifier with the same entity or object in proximity to the mobile device.

43. (Cancelled).

44. (Previously Presented). The method of Claim 31, further comprising

preventing the sending of the unique identifier, using the first radio, to the one or more servers, based upon previous detections of the respective unique identifier associated with the proximity beacon transmission.

45. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and

receiving further information relating to an object or entity associated with being within proximity to the mobile device.

46. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

preventing the sending of the unique identifier, using the first radio, to the one or more servers, based upon previous detections of the respective unique identifier associated with the proximity beacon transmission.

47. (Previously Presented). The mobile wireless device of Claim 1, wherein the instructions further comprise:

controlling further communications between the mobile device and at least one device or server associated with an entity or object in proximity to the mobile device.

48. (Previously Presented). The method of Claim 31, further comprising:

receiving, using the first radio, access code information by the mobile device from at least one of the servers; and

utilizing the access code information to gain access to the entity or object determined to be in proximity to the mobile device.

49. (Previously Presented). The method of Claim 31, wherein receiving the identifier related information, using the first radio, is performed in response to sending at least the unique identifier to at least one of the one or more servers using the first radio.

50. (Previously Presented). The method of Claim 31, additionally comprising:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and

receiving further information relating to an object or entity associated with being within proximity to the mobile device.

51. (Previously Presented). The method of Claim 50, wherein the further information relates to one or more of the following:

a loyalty program;

a payment service; or

a coupon relating to an entity in proximity to the mobile device; or

advertising content.

52. (Previously Presented). The method of Claim 50, wherein the further information relates to a service for providing a menu for use by a user of the mobile device for use in purchasing items, and further comprising:

allowing for the user take delivery at or near the location of a fixed proximity beacon device.

53. (Previously Presented). The method of Claim 50, wherein the further information relates to a nearby user of an application on another device, in common with an application on the mobile device.

54. (Previously Presented). The method of Claim 53, wherein the application is a multiuser game.

55. (Previously Presented). The method of Claim 31, additionally comprising:

controlling further communications between the mobile device and at least one device or server associated with an entity or object in proximity to the mobile device.

56. (Previously Presented). The method of Claim 31, wherein the step of determining that an entity or object is within proximity further comprises:

comparing the identifier related information with the unique identifier or information derived from the unique identifier.

57. (Previously Presented). The method of Claim 31, additionally comprising:

sending the unique identifier, using the first radio, to at least one server of the one or more servers, and wherein the one or more servers perform the following steps:

associating an object or entity as being within proximity to the mobile device;

storing a user's purchasing practices or requests from the one or more servers, related to the associated object or entity information as stored proximity user behavior;

retrieving a stored user email address associated with an account associated with the mobile device; and

sending an email, addressed to the user email address containing customized content based upon the stored proximity user behavior.

58. (Previously Presented). The mobile wireless device of Claim 1, wherein the one or more processors further execute the instructions to perform the operations for determining that an entity or object is within proximity by further:

comparing the identifier related information with the unique identifier or information derived from the unique identifier.

59. (Previously Presented). The mobile wireless device of Claim 1, wherein the receiving of the identifier related information, using the first radio, is performed in response to the one or more processors executing instructions for:

sending at least the unique identifier to at least one of the one or more servers using the first radio.

60. (Previously Presented). The method of Claim 31, wherein the proximity beacon transmissions are received, at the mobile device, without requiring the mobile device to first perform a step of transmitting to the one or more beacon transmitter devices from which the plurality of proximity beacon transmissions are received.

61. (New). The mobile wireless device of Claim 1 wherein

the identifier related information comprises a list of contact information, and

the one or more processors further execute the instructions to perform operations including:

further determining that at least one beacon transmitter device associated with the proximity beacon service is further matched with an entity included within the list of contact

information based upon comparing a contact identifier information with at least a portion of the unique identifier, and

the mobile wireless device, upon determining there is a match, allowing further communications with the detected beacon transmitter device associated with the entity included within the list of contact information, wherein the further communications utilize the first radio.

62. (New). The mobile wireless device of claim 4 wherein the one or more processors further execute the instructions to perform operations including:

receiving, via a second radio, the plurality of proximity beacon transmissions further includes receiving a first unique identifier at a first time that is different from a second unique identifier received at a second time; and

associating the first and second unique identifier with a single beacon transmitter device.

**Remarks**

Claims 1, 2, 4, 8, 12-13, 15, 17, 31, 35, 41-42 and 44-60 have been allowed.

Entry of the foregoing amendments is respectfully requested.

Claim 1 is amended at line 14, to capitalize the first letter of each word in the recited "Proximity Beacon Service Identifier (PBSI)".

Claims 8 and 15 are amended to insert "proximity" before "beacon service" to address a possible antecedent basis concern.

Claim 31 is amended at line 7, to change "the" to "a" before "proximity beacon service" to address a possible antecedent basis concern; and at lines 10-11, capitalize the first letter of each word in the recited "Proximity Beacon Service Identifier (PBSI)".

Claim 42 is amended at line 4, to insert "Beacon" before "Service Identifier (PBSI)"; and at lines 8-9 capitalize the first letter of each word in the recited "Proximity Beacon Service Identifier (PBSI)".

Entry of these amendments to claims 1, 8, 15, 31, and 42 embody merely the correction of formal matters without changing the scope thereof and are thus properly entered after allowance under 37 CFR 1.312.

Also,

new dependent claim 61 depends from claim 1 but is otherwise identical in scope to allowed claim 15 (which depends from claim 4); and

new dependent claim 62 depends from claim 4 but is otherwise identical to allowed claim 17 (which depends from claim 1).

Entry of these new claims 61 and 62 is (A) needed for full protection of the Applicant's invention, and (B) require no substantial amount of additional work on the part of the Office. They are therefore also believed to be properly entered under 37 CFR 1.312.

**Conclusion**

With entry of the foregoing amendments, all of the claims presented should be in condition to pass to issuance.

The Examiner is invited to contact the undersigned attorney by telephone if such a call would help resolve any remaining concerns.

Although no fee is believed to be due as a result of this Amendment, authorization is hereby given to charge USPTO Deposit Account No. 50-4929 for any fee deficiency.

February 17, 2022

Respectfully submitted,

/David J Thibodeau Jr Reg No 31671/

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Reg. No. 31,671
VLP Law Group LLP
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Fax: (617) 925-5530

PTO/SB/08a (02-18)
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| | 1 | 20030224787 | A1 | 2003-12-04 | GANDOLFO PIERRE T | |
| | 2 | 20060268746 | A1 | 2006-11-30 | WIJTING et al. | |
| | 3 | 20080205340 | A1 | 2008-08-28 | MEYLAN et al. | |
| | 4 | 20150200811 | A1 | 2015-07-16 | KASSLIN et al. | |

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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|---|---|---|---|
| | 1 | Final Office Action received for U.S. Patent Application No. 17/366,826, mailed on Dec 13, 2021, 42 pages. | |

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

## CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

X See attached certification statement.

X The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

## SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|---|---|---|---|
| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2022-02-25 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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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 the Freedom of Information Act requires disclosure of these record s.

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 inspections 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.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| SUBMISSION- INFORMATION DISCLOSURE STMT | 2806 | 1 | 130 | 130 |
| | | **Total in USD ($)** | | **130** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 45086864 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 25-FEB-2022 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 12:59:48 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $130 |
| RAM confirmation Number | E20222OD00211605 |
| 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 | Information Disclosure Statement (IDS) Form (SB08) | 20220225_111054-0001U4C7_TPO_Resubmission_SIDS_Certification.pdf | 1053542<br>10e43e2ff78c41dc4206072b191c5edead730ea0 | no | 4 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Non Patent Literature | NPL_Final_OA.pdf | 2770057<br>cd34db56cc9dea0d46f7652c98a43e458dfd1019 | no | 70 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 38240<br>c5afd0f5d54a1d841214c901784378c3864333f7 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 3861839 | | |

**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**

| | |
|---|---|
| In Re the Application of:<br>James A. Proctor, Jr., et al. | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

## COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

The Applicant hereby acknowledges the Examiner's Reasons for Allowance.

Applicant respectfully notes that there are additional reasons for allowance that have not been specifically cited, and which apply to various one of the allowed claims, in addition to or instead of the Examiner's stated reasons. Applicant respectfully suggests that notwithstanding the Examiner's Reasons for Allowance, it is believed that each of the allowed claims is patentable in its own right and/or for other reasons raised during the prosecution and/or explained in the specification of this application. To the extent that any statements regarding patentability of any claims allowed by the Examiner made by the Applicant or the Examiner in any document filed in this application are inconsistent with or not included in the Examiner's Reasons for Allowance, they are incorporated by reference herein.

March 1 , 2022

Respectfully submitted,

/ David J Thibodeau Jr Reg No 31671/

David J. Thibodeau, Jr.
Reg. No. 31,671
VLP Law Group LLP
Tel.: (617) 925-5520
Fax: (617) 925-5530

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 15271410 |
| **Filing Date:** | 21-Sep-2016 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Attorney Docket Number:** | 111054-0001U4C7 |

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 | 600 | 600 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **600** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 45119433 |
| **Application Number:** | 15271410 |
| **International Application Number:** | |
| **Confirmation Number:** | 7653 |
| **Title of Invention:** | EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED |
| **First Named Inventor/Applicant Name:** | James Arthur Proctor |
| **Customer Number:** | 86012 |
| **Filer:** | David J. Thibodeau/Elisabeth Smith |
| **Filer Authorized By:** | David J. Thibodeau |
| **Attorney Docket Number:** | 111054-0001U4C7 |
| **Receipt Date:** | 01-MAR-2022 |
| **Filing Date:** | 21-SEP-2016 |
| **Time Stamp:** | 17:19:25 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $600 |
| RAM confirmation Number | E202231H19431494 |
| 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) | 20220301_111054-0001U4C7_TPO_Issue_Fee_Trans-Signed.pdf | 967129<br>73a5dd36ed81b52b91ca8d1999598911f8f4c65e | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Miscellaneous Incoming Letter | 20220301_111054-0001U4C7_TPO_Comments_Statement_Reasons_Allowance.pdf | 72615<br>281498e34e2e4527513d18db53de66e1693d2897 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 38172<br>0b16b072cfb1dd971997ea70942002d93dee843f | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 1077916 | | |

**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.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

86012 7590 12/02/2021
VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

| | |
|---|---|
| Elisabeth Smith | (Typed or printed name) |
| /Elisabeth Smith/ | (Signature) |
| March 1, 2022 | (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

TITLE OF INVENTION: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED

| APPLN. TYPE | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | SMALL | $600 | $0.00 | $0.00 | $600 | 03/02/2022 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| SHERR, MARIA CRISTI OWEN | 3685 | 705-050000 |

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 03-09 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 David J. Thibodeau, Jr.
2 VLP Law Group LLP
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Proxicom Wireless, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Indialantic, FL

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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 /David J Thibodeau Jr./ Date 1-March-2022

Typed or printed name David J. Thibodeau, Jr. Registration No. 31671

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. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 03/29/2022

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 03/29/2022 | ELECTRONIC |

**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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

| ***Corrected*** ***Notice of Allowability*** | **Application No.** 15/271,410 | **Applicant(s)** Proctor et al. | |
|---|---|---|---|
| | **Examiner** CRISTINA O SHERR | **Art Unit** 3685 | **AIA (FITF) 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 IDS filed 08 February, 2022, 08 February 2022, and 25 February 20222.
   ☐ 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 1-2, 4, 8,12-13,15,17, 31. 35, 41-42, and 44-60 . 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 See Continuation Sheet.
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 _____.

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: February 8 2022, February 8, 2022, and 25 February 2022

## DETAILED ACTION

### *Notice of Pre-AIA or AIA Status*

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

### *Information Disclosure Statement*

2. The information disclosure statements (IDS) submitted on February 8, 2022 (two (2) such statements), and February 25, 2022, are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

### *Conclusion*

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRISTINA OWEN SHERR whose telephone number is (571)272-6711. The examiner can normally be reached on Monday-Friday, 8:30 - 5:30.

4. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W Hayes can be reached on 571-272-6708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. 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 https://ppair-my.uspto.gov/pair/PrivatePair. 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.

/Mohammad A. Nilforoush/
Primary Examiner, Art Unit 3685

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. 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 contains a valid OMB control number.

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

| | |
|---|---|
| Application Number | 15271410 |
| Filing Date | 2016-09-21 |
| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

**U.S.PATENTS** Remove

| Examiner Initial* | Cite No | Patent Number | Kind Code[1] | Issue Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|---|---|---|---|---|---|---|
| | 1 | | | | | |

If you wish to add additional U.S. Patent citation information please click the Add button. Add

**U.S.PATENT APPLICATION PUBLICATIONS** Remove

| Examiner Initial* | Cite No | Publication Number | Kind Code[1] | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|---|---|---|---|---|---|---|
| | 1 | 20030224787 | A1 | 2003-12-04 | GANDOLFO PIERRE T | |
| | 2 | 20060268746 | A1 | 2006-11-30 | WIJTING et al. | |
| | 3 | 20080205340 | A1 | 2008-08-28 | MEYLAN et al. | |
| | 4 | 20150200811 | A1 | 2015-07-16 | KASSLIN et al. | |

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

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| Examiner Initial* | Cite No | Foreign Document Number[3] | Country Code[2] i | Kind Code[4] | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T[5] |
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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
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| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2022-02-25 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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Doc description: Information Disclosure Statement (IDS) Filed

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| First Named Inventor | James Arthur Proctor |
| Art Unit | 3685 |
| Examiner Name | SHERR, MARIA CRISTI OWEN |
| Attorney Docket Number | 111054-0001U4C7 |

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| | 1 | 8352323 | B2 | 2013-01-08 | Fisher Michelle | |

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|---|---|---|
| | 1 | Non-Final Office Action received for U.S. Patent Application No. 14/861,563, mailed on May 09, 2016, 16 pages. |
| | 2 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Jun 09, 2020, 22 pages. |
| | 3 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Nov 24, 2020, 34 pages. |
| | 4 | Non-Final Office Action received for U.S. Patent Application No. 16/817,896, mailed on Sep 03, 2020, 23 pages. |
| | 5 | Non-Final Office Action received for U.S. Patent Application No. 17/366,826, mailed on Aug 17, 2021, 40 pages. |
| | 6 | Notice of Allowance received for U.S. Patent Application No. 16/817,896, mailed on Jun 08, 2021, 17 pages. |
| | 7 | Notice of Allowance received for U.S. Patent Application No. 16/817,896, mailed on Jun 28, 2021, 4 pages. |
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| | | | |
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| Signature | /David Thibodeau/ | Date (YYYY-MM-DD) | 2022-02-08 |
| Name/Print | David Thibodeau | Registration Number | 31671 |

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| | 2 | 20060268746 | A1 | 2006-11-30 | WIJTING et al. | |
| | 3 | 20080205340 | A1 | 2008-08-28 | MEYLAN et al. | |
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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 inspections 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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.O.S/

| INFORMATION DISCLOSURE STATEMENT BY APPLICANT ( Not for submission under 37 CFR 1.99) | | |
|---|---|---|
| | Application Number | 15271410 |
| | Filing Date | 2016-09-21 |
| | First Named Inventor | James Arthur Proctor |
| | Art Unit | 3685 |
| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

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Change(s) applied to document, /M.H.E./ 12/6/2021



ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.O.S/

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| | Filing Date | 2016-09-21 |
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| | Examiner Name | SHERR, MARIA CRISTI OWEN |
| | Attorney Docket Number | 111054-0001U4C7 |

| | | | | | | |
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| Change(s) applied to document, /M.H.E./ 12/6/2021 | 7 | 20010003191 | A1 | ~~2009-04-07~~ 06/2001 | Kovacs et al. | |
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.O.S/

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

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| Application Number | 15271410 |
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| Attorney Docket Number | 111054-0001U4C7 |

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If you wish to add additional U.S. Patent citation information please click the Add button. Add

**U.S.PATENT APPLICATION PUBLICATIONS** Remove

| Examiner Initial* | Cite No | Publication Number | Kind Code[1] | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
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| Change(s) applied to document. /M.H.E./ 12/6/2021 | 1 | 20090288012 | A1 | ~~2009-00-19~~ 11/2009 | Hertel et al. | |
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PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

**( Not for submission under 37 CFR 1.99)**

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| Application Number | 15271410 |
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**U.S.PATENTS** Remove

| Examiner Initial* | Cite No | Patent Number | Kind Code[1] | Issue Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
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Change(s) applied to document,
/M.H.E./
12/6/2021

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 04/05/2022

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/05/2022 | ELECTRONIC |

**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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

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U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450

| APPLICATION NO./ CONTROL NO. | FILING DATE | FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION | ATTORNEY DOCKET NO. |
|---|---|---|---|
| 15/271,410 | 09/21/2016 | Proctor et al. | 111054-0001U4C7 |

| | | EXAMINER | |
|---|---|---|---|
| VLP Law Group LLP<br>555 Bryant Street Suite 820<br>Palo Alto, CA 94301 | | CRISTINA O SHERR | |
| | | ART UNIT | PAPER |
| | | 3685 | 20220318 |

DATE MAILED: _____

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner for Patents**

The amendment filed 02/17/2022 has been entered. Please see the attached PTO-271.

| | |
|---|---|
| /C.O.S/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |

PTO-90C (Rev.04-03)

| Response to Rule 312 Communication | Application No. | Applicant(s) | |
|---|---|---|---|
| | 15/271,410 | Proctor, James Arthur | |
| | Examiner | Art Unit | AIA (FITF) Status |
| | CRISTINA O SHERR | 3685 | No |

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

1. ☑ The amendment filed on 17 February 2022 under 37 CFR 1.312 has been considered, and has been:
   a) ☑ entered.
   b) ☐ entered as directed to matters of form not affecting the scope of the invention.
   c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
      Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.
   d) ☐ disapproved. See explanation below.
   e) ☐ entered in part. See explanation below.
   f) ☐ not entered because the supplemental or corrected Application Data sheet (ADS)
      ☐ was not accompanied by a petition to accept an unintentionally delayed claim under 37 CFR 1.55 or 27 CFR 1.78;
      ☐ did not identify the information being changed in accordance with 37 CFR 1.76(c)(2);
      ☐ was not properly signed in accordance with 37 CFR 1.76(e) (or 37 CFR 1.33(b) for applications filed prior to September 16, 2012).

| /C.O.S/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |
|---|---|

OK TO ENTER: /C.O.S/

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | |
|---|---|
| In Re the Application of:<br>James A. Proctor, Jr., et al. | |
| Serial No.: 15/271,410 | Examiner: Sherr, Cristina Owen |
| Filed: September 21, 2016 | Art Unit: 3685 |
| For: EXCHANGING IDENTIFIERS BETWEEN WIRELESS COMMUNICATION TO DETERMINE FURTHER INFORMATION TO BE EXCHANGED OR FURTHER SERVICES TO BE PROVIDED | Confirmation No.: 7653 |

## AMENDMENT AFTER ALLOWANCE

Appellant hereby submits this Amendment after Allowance pursuant to 37 CFR 1.312.

**Amendments to the Claims** begin on page 2.

**Remarks** begin on page 11.

OK TO ENTER: /C.O.S/

UNITED STATES PATENT AND TRADEMARK OFFICE

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 15/271,410 | 09/21/2016 | James Arthur Proctor JR. | 111054-0001U4C7 | 7653 |

86012 7590 04/20/2022

VLP Law Group LLP
555 Bryant Street
Suite 820
Palo Alto, CA 94301

| EXAMINER |
|---|
| SHERR, MARIA CRISTI OWEN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 3685 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/20/2022 | ELECTRONIC |

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Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patents@vlplawgroup.com

| **Corrected**<br>***Notice of Allowability*** | **Application No.**<br>15/271,410 | **Applicant(s)**<br>Proctor et al. | |
|---|---|---|---|
| | **Examiner**<br>CRISTINA O SHERR | **Art Unit**<br>3685 | **AIA (FITF) Status**<br>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 amendment filed 17 February 2022.
   ☐ 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 See Continuation Sheet . 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 Form PTO-271.

| /C.O.S/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |
|---|---|

Continuation of 3. The allowed claim(s) is/are: 1-2,4,8,12-13,15,17,31,35,41-42 and 44-62

UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
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| APPLICATION NO./ CONTROL NO. | FILING DATE | FIRST NAMED INVENTOR/ PATENT IN REEXAMINATION | ATTORNEY DOCKET NO. |
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| 15/271,410 | 09/21/2016 | Proctor et al. | 111054-0001U4C7 |

| | | EXAMINER | |
|---|---|---|---|
| VLP Law Group LLP<br>555 Bryant Street Suite 820<br>Palo Alto, CA 94301 | | CRISTINA O SHERR | |
| | | ART UNIT | PAPER |
| | | 3685 | 20220414 |

DATE MAILED: _____

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner for Patents**

The amendment filed 02/17/2022 has been entered. Please see the attached PTO-271.

| | |
|---|---|
| /C.O.S/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |

PTO-90C (Rev.04-03)

| Response to Rule 312 Communication | Application No. | Applicant(s) | |
|---|---|---|---|
| | 15/271,410 | Proctor et al. | |
| | Examiner | Art Unit | AIA (FITF) Status |
| | CRISTINA O SHERR | 3685 | No |

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1. ☑ The amendment filed on 17 February 2022 under 37 CFR 1.312 has been considered, and has been:

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b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

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d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

f) ☐ not entered because the supplemental or corrected Application Data sheet (ADS)

☐ was not accompanied by a petition to accept an unintentionally delayed claim under 37 CFR 1.55 or 27 CFR 1.78;

☐ did not identify the information being changed in accordance with 37 CFR 1.76(c)(2);

☐ was not properly signed in accordance with 37 CFR 1.76(e) (or 37 CFR 1.33(b) for applications filed prior to September 16, 2012).

| /C.O.S/<br>Examiner, Art Unit 3685 | /Mohammad A. Nilforoush/<br>Primary Examiner, Art Unit 3685 |
|---|---|