



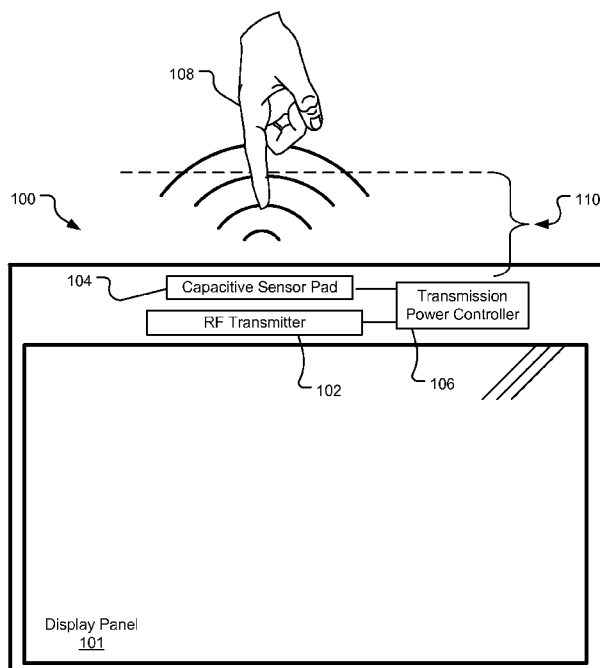
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[Continued on next page]

(54) Title: RADIOFREQUENCY-WAVE-TRANSPARENT CAPACITIVE SENSOR PAD



(57) Abstract: A capacitive sensor pad is co-located with (e.g., overlapping) an RF transmitter without causing significant degradation to the performance of the antenna. In one implementation, tuning the resistance per square in the capacitive sensor pad can provide effective sensor pad range and performance while providing making the capacitive sensor pad sufficiently transparent to radiofrequency waves to provide excellent antenna efficiency, despite the co-location of the capacitive sensor pad and the antenna.

FIG. 1

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INTERNATIONAL SEARCH REPORT

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| International application No PCT/US2014/072413 |
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|---|--|--|--|--|
| A. CLASSIFICATION OF SUBJECT MATTER INV. H01Q1/44 H03K17/955 H03K17/945 ADD. | | | | |
| 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) G06F H01Q H03K | | | | |
| 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) EPO-Internal, WPI Data | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | |
| X Y | EP 2 276 108 A1 (APPLE INC [US]) 19 January 2011 (2011-01-19) paragraph [0037] - paragraph [0044]; figure 4 paragraph [0051] - paragraph [0052]; figure 6 paragraph [0008] | 1-7, 11-15 8,9 | | |
| X A | ----- WO 2013/103948 A2 (ACCESS BUSINESS GROUP INT LLC [US]) 11 July 2013 (2013-07-11) paragraph [0056] - paragraph [0059]; figures 1-3 paragraph [0088]; figure 21 paragraph [0010] paragraph [0014] | 1, 10, 13, 14 2-9, 11, 12, 15 | | |
| ----- -/-- | | | | |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex. | | | | |
| * Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 </td> </tr> </table> | | | "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 |
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| Date of the actual completion of the international search | Date of mailing of the international search report | | | |
| 8 July 2015 | 16/07/2015 | | | |
| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 | Authorized officer Fermentel, Thomas | | | |

INTERNATIONAL SEARCH REPORT

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| International application No PCT/US2014/072413 |
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/072413

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional 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.:

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-7, 10-15

Groups of non-unitary inventions searched without additional fee:

1.1. claims: 1-4, 13, 14

RF antenna transmitting through a capacitive sensor overlapping it and techniques to prevent capacitive sensor to create noise for the RF antenna

1.2. claims: 5-7

Adjustment of RF transmitted power depending on the presence/absence of an object close to the antenna

1.3. claims: 10-12

Positioning of the capacitive sensor pad in the close vicinity of the RF antenna

1.4. claim: 15

Additional sensor pad placed substantially orthogonally to the first sensor pad

2. claims: 8, 9

Group of non-unitary invention searched after payment of additional fees: Suitable sheet resistivity value of the material used for the capacitive sensor pad

INTERNATIONAL SEARCH REPORT

Information on patent family members

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| International application No PCT/US2014/072413 |
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