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- Declarations under Rule 4.17:**
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
 - as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- Published:**
- with international search report (Art. 21(3))

[Continued on next page]

(54) Title: DISTINGUISHING AND COMMUNICATING BETWEEN WHITE SPACE DEVICES TRANSMITTING ATSC-COMPATIBLE SIGNALS

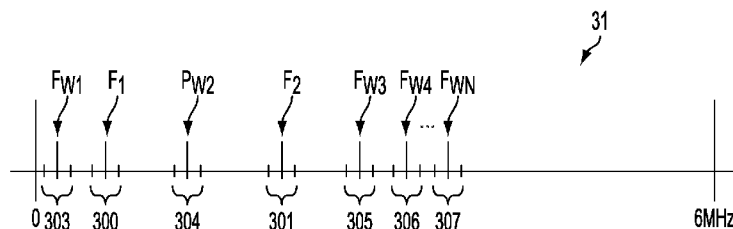


FIG. 3B

(57) Abstract: White space signals are differentiated from licensed ATSC signals through modification of a waveform of the white space signal. White space signals may be modified by shifting the ATSC-compatible waveform so that the pilot frequency of the white space signal is at a location outside of the frequency range associated with the pilot frequency in a licensed ATSC signal or embedding a watermark signal into said ATSC-like white space signals. White space device transmitters generate the signals with these modifications and white space receivers are equipped to detect whether a pilot exists in the standard licensed pilot frequencies. Based on these differences, white space devices can better operate without interfering with licensed ATSC transmission. Additionally, the modification techniques may be used to embed data in the white space signal that may be used to communicate connection data or networking data to other white space devices.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
9 September 2011

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2011/020256

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N5/44
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)
H04W H04N

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/113929 A2 (ROHDE & SCHWARZ INC [US]; SIMON MICHAEL [US] ROHDE & SCHWARZ [DE]; SIM) 26 October 2006 (2006-10-26) paragraph [0023] - paragraph [0024] -----	1,6,9, 14,17, 19,21,23
X	WO 2008/114216 A2 (KONINKL PHILIPS ELECTRONICS NV [NL]; GHOSH MONISHA [US]) 25 September 2008 (2008-09-25) page 1, line 20 - line 26 page 2, line 10 - line 23 page 5, line 14 - line 16 -----	1-23
A	US 2008/165680 A1 (CHANG SOO-YOUNG [US]) 10 July 2008 (2008-07-10) paragraph [0102] -----	1,6,9, 14,17, 19,21,23

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 document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

28 April 2011

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08/07/2011

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/020256

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.:

1-23

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: 1-23

EITHER shifting pilot signal frequencies OR embed a watermark signal in a signal

2. claims: 24-26

detecting information in an embedded signal of a received signal

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/020256

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
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