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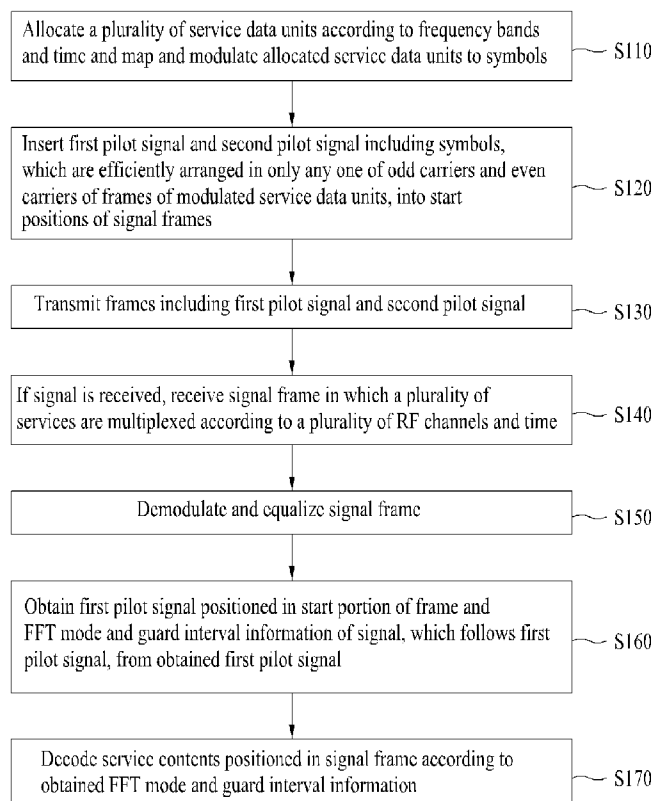
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[Continued on next page]

(54) Title: APPARATUS FOR TRANSMITTING AND RECEIVING A SIGNAL AND A METHOD OF TRANSMITTING AND RECEIVING A SIGNAL

[Fig. 15]



(57) Abstract: A method of transmitting/receiving a signal and an apparatus for transmitting/receiving a signal are disclosed. The signal receiving method includes receiving a signal frame in which a plurality of services are multiplexed according to a plurality of radio frequency (RF) channels and time, modulating and equalizing the signal frame, obtaining a first pilot signal positioned at a start portion of the frame and obtaining a Fast Fourier Transform (FFT) mode of a signal, which follows the first pilot signal, from the first pilot signal, and decoding service contents positioned in the signal frame according to the obtained FFT mode.

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**A. CLASSIFICATION OF SUBJECT MATTER*****H04N 7/015(2006.01)i***

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975

Japanese 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): "OFDM, pilot symbol, synchronization"

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                          | Relevant to claim No. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X<br>A    | EP 1780966 A1 (FUJITSU LIMITED) 2 May 2007<br>See paragraphs [0004],[0020]-[0021]; figures 1,5.                             | 11,12<br>1-10,13,14   |
| X<br>A    | WO 92-16063 A1 (PHILIPS CORP.) 17 September 1992<br>See abstract; page 7 line 11- page 8 line 16; figure 5.                 | 11,12<br>1-10,13,14   |
| A         | JP 2000-022660 A (TOSHIBA CORP.) 21 January 2000<br>See abstract; paragraphs [0021]-[0030], [0038]-[0044]; figures 2-4, 15. | 1-14                  |



Further documents are listed in the continuation of Box C.



See patent family annex.

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| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                                                                                                                                                                                                                                        | Publication<br>date                                                                                                                                                                                                                                                                  |
|-------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP 1780966 A1                             | 02.05.2007          | CN 1956433 A<br>JP 2007-124654 A<br>KR 10-2007-0044794 A<br>US 2007-189334 A1                                                                                                                                                                                                                                                                     | 02.05.2007<br>17.05.2007<br>30.04.2007<br>16.08.2007                                                                                                                                                                                                                                 |
| WO 92-16063 A1                            | 17.09.1992          | AT 147562 T<br>AU 1379092 A<br>AU 660965 B2<br>CA 2101248 A1<br>CA 2101248 C<br>DE 69216591 D1<br>DE 69216591 T2<br>DK 573541 T3<br>EP 0573541 A1<br>EP 0573541 B1<br>ES 2099250 T3<br>FI 933776 A<br>FI 113117 B1<br>GB 9104241 D0<br>KR 10-1993-0703758 A<br>KR 10-242400 B1<br>JP 06-505377 A<br>JP 03043415 B2<br>SG 44771 A1<br>US 5550812 A | 15.01.1997<br>06.10.1992<br>13.07.1995<br>29.08.1992<br>28.07.1998<br>20.02.1997<br>10.07.1997<br>16.06.1997<br>15.12.1993<br>08.01.1997<br>16.05.1997<br>27.08.1993<br>27.02.2004<br>17.04.1991<br>30.11.1993<br>01.02.2000<br>16.06.1994<br>10.03.2000<br>19.12.1997<br>27.08.1996 |
| JP 2000-022660 A                          | 21.01.2000          | JP 3558879 B2                                                                                                                                                                                                                                                                                                                                     | 25.08.2004                                                                                                                                                                                                                                                                           |