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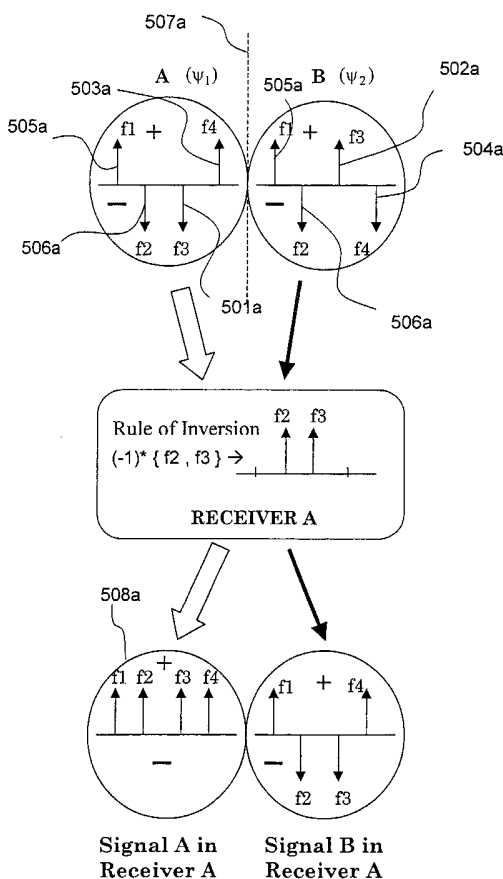
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[Continued on next page]

(54) Title: CELLULAR COMMUNICATION SYSTEM WHICH USES MULTICARRIER SPREAD-SPECTRUM TRANSMISSION



(57) Abstract: A frequency band, to be used by each cell within a group of cells, is obtained and the number, $m=2^n$ ($n=1, 2, \dots$), of orthogonal sub-carriers, f_1, f_2, \dots, f_m , over which individual data are transmitted in each communication channel, is determined for all cells within the group. A phase, ϕ_i , is allocated to each sub-carrier f_i ($i=1, 2, \dots, m$) within a cell, such that the absolute value ϕ_i is determined by the data that is transmitted, and by the digital modulation scheme, and is identical for all f_i within the cell, and the sign of each ϕ_i within the cell is identical to the sign of a corresponding element taken from a row in an $m \times m$ Walsh-Hadamard matrix that corresponds to that cell, such that neighbouring/overlapping cells use different rows. The data in each cell are transmitted over the sub-carriers with their corresponding phases. All transmissions carried by all sub-carriers are received and the total phase Φ_i of all the received signals at frequency f_i is obtained. The sign of total phase Φ_i is changed for each cell, for all values of i that correspond to negative elements in the corresponding row of that cell's matrix. The phase, ϕ_i , of any transmitted sub-carrier, f_i , is obtained by summing the values of the total phase, Φ_i , after changing phase signs, and dividing the result of the summation by a number determined according to m and/or the ratio between the magnitudes of the sub-carriers within a cell, and the magnitudes of the sub-carriers within its neighbouring/overlapping cells.

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INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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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, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 282 222 A (ZAGHLOUL HATIM ET AL) 25 January 1994 (1994-01-25) abstract column 5, line 24 - line 38 column 6, line 30 - line 46 claim 1	1-22
A	US 5 970 053 A (MCQUILLEN JR EDWARD JAMES ET AL) 19 October 1999 (1999-10-19) abstract claims 1,9	1-22

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5282222	A	25-01-1994	EP 0562868 A2 US RE36533 E	29-09-1993 25-01-2000
US 5970053	A	19-10-1999	NONE	