(34) Abstract: A method for synchronizing receivers that received turbo encoded signals to a received signal. Turbo encoding may enable signals to be decoded at a much lower signal to noise ratio than previously practical. A traditional method of synchronizing a receiver to an incoming signal is to use a slicer to determine a received symbol and then to compare the determined symbol to the incoming waveform, in order to adjust the phase of the slicer with respect to the incoming signal. At signal low levels, at which turbo encoded signals may be decoded, this slicing method may be prone to errors that may disrupt the synchronization of the receiver to the incoming signal. By replacing the slicer by a Viterbi decoder with zero traceback (i.e. one which does not consider future values of the signal only past values) a prediction as to what the incoming signal is can be made. Because the Viterbi decoder can consider past signal values it can predict the present symbol being received with higher reliability than by using a slicer, which considers only the present value of the incoming signal.
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 H04L1/00 H04L27/00

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 H03M

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, IBM-TDB

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>

| Y        | -/-                                                                 | 12 |

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents:
- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "L" document which may throw doubts on priority claims (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

*' 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

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"Z" document member of the same patent family

Date of the actual completion of the international search: 26 September 2001

Date of mailing of the international search report: 09/10/2001

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Authorized officer
Gigliotti, L.

*Form PCT/ISA/210 (second sheet) (July 1992)*

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</table>
Continuation of Box I.2

Claims Nos.: 21-61

The various definitions of the invention given in the independent claims overlap to a large extent, thereby rendering the whole set of claims not concise. The large number of claims presently on file renders it difficult, if not impossible, to determine the matter for which protection is sought. Therefore, the present application fails to comply with the requirements of clarity and conciseness of Article 6 PCT (see also Rule 6.1(a) PCT) to such an extent that a meaningful search is impossible.

Consequently, the search has been carried out for those parts of the application which do appear to be clear (and concise), namely the method and the receiver claimed in claims 1 to 20.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.