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D E C I S I O N
of 15 June 2004

Case Number: T 0982/01 - 3.5.3

Application Number: 90119336.7

Publication Number: 0480083

IPC: H04B 1/66

Language of the proceedings: EN

Title of invention:
Communication signal compression system and method

Patentee:
InterDigital Technology Corporation

Opponent:
Motorola, Inc.

Headword:
Signal compression system/InterDigital

Relevant legal provisions:
EPC Art. 114(2), 123(2), 56

Keyword:
"Late filed material"
"Amendments - added subject-matter (no)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0982/01 - 3.5.3

D E C I S I O N
of the Technical Board of Appeal 3.5.3
of 15 June 2004

Appellant: (Opponent)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 19 July 2001 concerning maintenance of European patent No. 0480083 in amended form.

Composition of the Board:

Chairman: A. S. Clelland
Members: F. van der Voort
R. T. Menapace

Summary of Facts and Submissions

I. This appeal is against the decision of the Opposition Division finding European patent No. 0 480 083 in amended form to meet the requirements of the EPC.

II. The opposition was filed against the patent as a whole and on the grounds that the claimed subject-matter was not new and did not involve an inventive step (Article 100(a) EPC). During the opposition proceedings, the opponent referred, *inter alia*, to the following documents:

D1: D. Lin *et al*, "Data Compression of Voiceband Modem Signals", 40th IEEE Vehicular Technology Conference, 6 - 9 May 1990, Orlando, Florida, USA, pages 323 - 325;

D6: US 4 675 863 A; and

D7: EP 0 115 499 B.

Document D7 was filed in the course of the opposition and was published after the application date of the patent in suit; the Opposition Division decided under Article 114(2) EPC not to admit it into the opposition proceedings.

The Opposition Division held that the amendments made to the claims as granted in accordance with a main request met the requirements of Article 123(2) EPC and that the subject-matter of these claims involved an inventive step.

III. The independent claims as found by the Opposition Division to comply with the EPC read as follows:

"1. A method of communicating communication signals (20) of differing types between various locations (10, 11) over a selected carrier medium (24) of a telecommunication system, wherein the communication signal (20) is compressed to facilitate its transmission over the selected carrier medium (24) and the communication signal (20) is reconstructed after reception, said method comprising the steps of:

transforming the communication signal (20) into two separate components including:

determining the approximate center frequency Ω of the communication signal (20),

mixing the communication signal (20) with $\cos(\Omega t)$ to produce an in-phase signal component (30), and

mixing the communication signal (20) with $\sin(\Omega t)$ to produce a quadrature signal component (31); and

quantizing each of the separated in-phase and quadrature signal components (30, 31) thereby encoding the separated signal components (30, 31) into quantized in-phase and quadrature signals (36, 37) and an associated quantization gain parameter (G) to produce a compressed encoded signal (21) for transmission over the selected carrier medium (24) of the communication system,

characterized in that the method further comprises the step of including in the compressed encoded signal a unique word (U) to indicate the type of signal being communicated."

"11. A telecommunication system for communicating communication signals (20) of differing types between

various locations (10, 11) over a selected carrier medium (24) wherein the communication signal (20) is compressed to facilitate its transmission over the selected carrier medium (24) and said communication signal (21) is reconstructed after reception; said telecommunication system comprising a signal compression encoder (22), wherein said encoder (22) comprises:

means for transforming a communication signal into two separate components including:

means for determining (27) the approximate center frequency Ω of the communication signal (20),

means for mixing the communication signal (20) with cos(Ωt) to produce an in-phase signal component (30), and

means for mixing the communication signal (20) with sin(Ωt) to produce a quadrature signal component (31); and

means for quantizing each of the separated in-phase and quadrature signal components (30, 31) thereby encoding the separated in-phase and quadrature signal components (30, 31) into quantized in-phase and quadrature signals (36, 37) and an associated quantization gain parameter (G) to produce a compressed encoded signal (21) for transmission over the selected carrier medium (24) of the communication system, characterized in that said encoder further comprises means for inserting a unique word (U) into the compressed encoded signal (21) to indicate the type of signal being communicated."

IV. The opponent filed an appeal and requested that the decision of the Opposition Division be set aside and the patent be revoked in its entirety. Oral proceedings

were conditionally requested. The appellant argued that the claims violated Article 123(2) EPC and that the subject-matter of independent claims 1 and 11 lacked an inventive step. In support of the arguments the following document was filed:

D7': WO 84/00650 A.

Document D7' is a published application corresponding to document D7 and forms part of the state of the art in accordance with Article 54(2) EPC.

V. In response to the notice of appeal the respondent (proprietor) requested that the appeal be dismissed. Oral proceedings were conditionally requested.

VI. The parties were summoned by the Board to oral proceedings. In a communication accompanying the summons, the Board gave a preliminary opinion and drew attention to matters to be discussed at the oral proceedings.

VII. In response to the Board's communication, the respondent filed four auxiliary requests and requested the Board, if the main request to dismiss the appeal were to fail, to remit the case for consideration of the auxiliary requests by the first instance. A remittal was also requested in case the Board were to consider D7 or D7' relevant to the question of inventive step.

VIII. Oral proceedings were held on 15 June 2004. At the end of the oral proceedings the chairman announced the Board's decision.

Reasons for the Decision

1. *Admissibility of D7 and D7'*

1.1 D7 was late published whereas D7' constitutes prior art, see points II and IV above. The Board notes that D7' was referred to by the Opposition Division during the oral proceedings (see the minutes, point 5). The contents of D7' substantially correspond to those of D7, which were discussed in detail by the proprietor in the letter of 18 May 2001 (page 4, 4th para., to page 6, 3rd para.).

1.2 In view of the above and pursuant to Article 114(2) EPC the Board admitted D7', but not D7, into the appeal proceedings.

1.3 The Board also decided in accordance with Article 111(1) EPC to exercise the power within the competence of the Opposition Division to examine the question of inventive step having regard to D7' rather than remit the matter to the first instance.

2. *Article 123(2) EPC (main request)*

2.1 The appellant argued that the claimed subject-matter contravenes Article 123(2) EPC, since in claims 1 and 11 the "unique word" is defined as an indication of the type of signal being communicated, whereas in the application as filed (page 12, lines 23 - 25; cf. col. 6, lines 55 - 58 of the patent) it is stated that the unique word also conveys timing information.

2.2 The Board cannot follow this argument. In the application as filed, there are several statements regarding the term "unique word" which do mention that the unique word is for indicating the type of signal, but are silent on the conveyance of timing information; see, in particular, page 17, lines 20 - 25 (cf. col. 9, lines 21 - 27 of the patent) and page 19, line 27, to page 20, line 6 (cf. col. 10, lines 28 - 35 of the patent). In the Board's view, an inextricable relationship between the information concerning the type of signal and the timing information cannot therefore be derived from the application as filed.

2.3 Taking the disclosure of the application as a whole, the Board is thus satisfied that the term "unique word" as used in claims 1 and 11 does not result in the skilled person being presented with information which is not directly and unambiguously derivable from the application as filed. These claims do not therefore give rise to objection under Article 123(2) EPC.

3. *Inventive step (main request)*

3.1 It was common ground between the parties that D1 represents the closest prior art and that the features according to the preamble of claim 1 were known from D1. Regarding the characterizing part of claim 1, the expression "type of signal", as was already used in, *e.g.*, claims 9 and 24 as granted, is interpreted by the Board to refer to the communication signal being either a voice, a fax or a modem signal (see col. 6, lines 55 - 57 of the patent). The Board notes that the appellant understood this expression in a similar way, though

restricted to fax or modem (statement of grounds, page 6, 6th and 7th para.).

3.2 The appellant argued that the subject-matter of claim 1 lacked an inventive step in view of either the disclosure of D1 alone or D1 in combination with common general knowledge or the combination of D1 and D6 or the combination of D1 and D7'.

3.3 More specifically, with regard to D1 the appellant argued that, from the section relating to the signal classification (D1, page 324, left col.), describing the classification of the input signal by the coder as either voice or data by checking the first two reflection coefficients of each RELP frame, the skilled person would derive that a type of signal can be communicated to a receiver by means of certain flag bits. The Board cannot follow this argument. The signal classification referred to in D1 exclusively relates to the signal processing at the transmit side and is in order to select the appropriate coding mode for coding the voice or data signal. The classification is not based on the detection of flag bits but on the detection of an analog echo canceller disable tone, which is not present in the signal being communicated to the receiver.

3.4 The appellant further argued that the skilled person, aware of the disclosure of D1, would find the features according to the characterizing part of claim 1 obvious from common general knowledge. However, the appellant did not provide any evidence that the inclusion in a communication signal of a unique word to indicate the type of the communication signal is part of the common

general knowledge of a person skilled in the art. Therefore, this argument does not convince the Board.

3.5 As to the combination of D1 and D6, the appellant essentially argued as follows. D6 concerned a radio communication system for communication between a base station and a plurality of subscriber stations. The system was suitable for communicating information signals, such as voice, computer data and facsimile (see the abstract). As illustrated by tables 1 - 5, a subscriber station would be able to differentiate between different types of signals on the basis of the different frame structures for each of these signals. Furthermore, a unique word was used to identify the signal as a radio control channel (RCC) signal (see col. 19, lines 56 - 58), which was another indication of the type of signal being communicated. This also applied to the 16 symbol amplitude modulation gap, or "AM hole", which was transmitted only in RCC slots, whereas all of the other slot-types included only an 8 symbol "AM hole" (col. 21, lines 41 - 51). Starting from D1 and faced with the problem of enabling the receiver to correctly process the received signal according to its type, a person skilled in the art would therefore apply the above teaching of D6 to the method according to D1, thereby arriving at the claimed subject-matter without the application of inventive skill.

3.6 The Board cannot follow these arguments. Whereas in the system according to D6 the channel control unit of a subscriber station is able to interpret the transmitted data as DPSK, QPSK or 16 PSK (col. 63, lines 1 - 5) and thereby to distinguish, by analysis, the different

frame structures as shown in tables 1 - 5, these frame structures differ in terms of modulation level(s) and number of slots only and do not provide an indication of the type of signal being communicated, *e.g.* voice, modem or fax. If this were the case, there would be no reason to additionally include a unique word in the signal to indicate the type of signal, as required by the present invention, which would thus lead the skilled person away from the present invention. The unique word as referred to in D6 serves a purpose other than indicating the type of signal; it enables the base station or the subscriber station to identify an incoming RCC message in the radio control channel (see table 1, "UW"; col. 19, lines 30 - 34 and 56 - 58, col. 20, lines 10 - 17), which is irrespective of the remaining frequency channels carrying user voice or data information (col. 7, lines 43 - 50, col. 9, line 32). The same applies to the amplitude modulation gap ("AM hole"), which is used by the subscriber station, when set by default to an RCC frequency, to uniquely identify a received burst as the radio control channel (col. 19, lines 37 - 42, col. 21, lines 41 - 51). Hence, neither the unique word nor the "AM hole" indicates the type of signal, *i.e.* voice, fax or modem.

3.7 The Board further notes that D6 at col. 42, lines 32 - 54 describes two distinct modes of the subscriber telephone interface unit (STU; Figs. 3 and 12); a first mode for receiving/transmitting voice information and a second mode for streaming data to/from a data device, *e.g.* a terminal. However, further information on the selection of the appropriate mode is not disclosed. In particular, in the Board's view, the inclusion of a unique word in the signal being communicated to

indicate that the signal contains voice information or a data stream is thereby neither disclosed nor suggested.

3.8 As to the combination of D1 and D7', the appellant essentially argued as follows. D7' related to a radio communication system capable of communicating voice and data. Figure 2 of D7' showed the format of an information word to be transmitted. Bit 31 thereof, if "0", indicated command or control data and, if "1", indicated free format data, such as text. Bit 31 therefore constituted a unique word to indicate the type of signal being communicated. In addition, the OP code field of the command data packet, *i.e.* bits 24 to 28, informed the receiver by which operation the received data should be processed. This taught the person skilled in the art that it was much simpler for the transmitter to inform the receiver about the type of signal being communicated than for the receiver to have to analyse the received data in order to generate independently such information at the receive side.

3.9 The Board, however, notes that although bits 24 to 28 and 31 indeed render it possible both to distinguish between command and free format data, and to specify a particular command or control operation (see page 8, lines 6 - 24, and page 9, lines 10 to 17), they do not constitute a means to indicate the type of the signal being communicated as either voice or data.

3.10 As to the reception of data at the receive side, the Board notes that, as illustrated in Fig. 16 of D7' and as described at page 48, line 23 ff., the mobile unit monitors the channel (block 794), tests for the

presence of 600 bps data (block 810) and separately checks to determine if the full 112 bits, indicating a complete data packet, are received (block 814). However, in the Board's view, none of these steps suggests the presence of a unique word in the signal being communicated to indicate the type of signal.

3.11 For the above reasons, the Board does not consider valid the inventive step objections as raised by the appellant in respect of claim 1. Further, independent claim 11 defines a system including the structural features corresponding to each of the method steps of claim 1. The reasoning given above in relation to claim 1 therefore applies *mutatis mutandis* to independent claim 11.

4. In view of the foregoing, the respondent's main request is found allowable and, consequently, it has not proved necessary to consider the auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Magliano A. S. Clelland