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D E C I S I O N
of 26 September 1994

Case Number: T 0457/92 - 3.5.1

Application Number: 82104973.1

Publication Number: 0067395

IPC: H04L 27/10

Language of the proceedings: EN

Title of invention:
Modem with low part

Patentee:
Hayes Microcomputer Products, Inc.

Opponent:
kabelmetal electro GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 114(2), 52(1), 56

Keyword:
"Late-filed documents admitted"
"Inventive step (yes)"

Decisions cited:
T 0326/87, T 0416/87

Catchword:
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Case Number: T 0457/92 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 26 September 1994

Appellant: (Opponent)	kabelmetal electro GmbH Kabelkamp 20 Postfach 2 60 D-30002 Hannover (DE)
Representative:	–
Respondent: (Proprietor of the patent)	Hayes Microcomputer Products, Inc. 5835 Peachtree Corners East Norcross Georgia 30092 (US)
Representative:	Patentanwälte Dr. Solf & Zapf Postfach 13 01 13 D-42028 Wuppertal (DE)

Decision under appeal: Decision of the Opposition Division of the European Patent Office dated 13 March 1992 rejecting the opposition filed against European patent No. 0 067 395 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: A. S. Clelland
C. Holtz

Summary of Facts and Submissions

1.   European patent No. 0 067 395 was granted on 31 May 1989
        on the basis of European patent application
        No. 82 104 973.1.

II.   An opposition to granted Claims 2 and 3 was filed on the
        grounds that the subject matter of these claims did not
        involve an inventive step (Article 100(a) EPC).

        In the course of the opposition proceedings reference
        was made inter alia to the following documents

        D1: US-A-4 387 440 (already cited in the patent);
        D2: CCITT-Recommendations of the V-Series, Yellow-Book,
             Geneva 1981, Recommendation V.27ter, pages 148 to
             160;

III.   Claim 2 reads:

        "A modem including a data port (50) for connecting said
        modem to a utilisation device, and a telephone port (46)
        for connecting said modem to a telephone line, said
        modem being of the type having two distinct modes of
        operation:

        (a) a transparent mode of operation for which said modem
        provides modulated signals to said telephone port in
        response to data signals provided to said data input
        port; and

        (b) a command mode of operation for which said modem
        responds to said data signals provided to said data port
        as instructions to said modem;

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said modem including means (55, 116) defining a predetermined sequence of data signals as an escape character;

characterised by:

timing means (117) for detecting each occurrence of a passage of a predetermined period of time after provision of one of said data signals to said data input port; and

mode control means (83, 111), operative when said modem is in said transparent mode of operation, for detecting provision of said predetermined sequence of data signals for causing said modem to switch to said command mode of operation, if and only if said predetermined sequence of data signals occurs contiguous in time with at least one said occurrence of said passage of said predetermined period of time during which none of said data signals are provided to said data input port."

Dependent Claim 3 limits Claim 2 to the case where the mode change occurs if and only if "said predetermined sequence of data signals" is both preceded and followed by the "said passage of said predetermined period".

IV.   By its decision of 13 March 1992, the Opposition Division rejected the opposition.

V.   On 14 May 1992 the Opponent filed a notice of appeal against this decision and paid the prescribed appeal fee. Cancellation of the decision and revocation of the patent for the granted Claims 2 and 3 were requested, with an auxiliary request for oral proceedings. A statement setting out the Grounds of Appeal was

subsequently filed on 11 July 1992. In addition to documents D1 to D2, the Statement of Grounds cited the new document

D4: CCITT-Provisional Recommendation X.28, Geneva 1977, pages 50 to 73.

VI. The Respondent (Proprietor) requested that the appeal be rejected and made an auxiliary request for oral proceedings.

VII. In the further course of the proceedings the Appellant pointed out that document D1 was only published on 7 June 1983, whereas the contested patent had been filed on 7 June 1982. The Appellant further submitted two new documents

D5: US-A-3 937 882 and
D6: D.C.Hayes Associates, Inc.: "MICROMODEM II for the Apple II Personal Computing System", 1978, pages 1 to 50,

on the grounds that since D1 was not prior published, D6 should replace it as the nearest prior art document, and because D5 was of such relevance, in combination with D6, as to give grounds for reversing the Opposition Division's decision. Claims 2 and 3 had been introduced into the application only after it had been searched and no additional search had ever been carried out; it was therefore not unreasonable that the Appellant should be allowed to present the results of his own search, even if late in the procedure.

In a letter received 9 July 1993 the Respondent agreed that D1 was not prior published, but declared that a modem having the features described in D1 was on sale in the United States before the claimed priority date of 15

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June 1981, so that the modem formed part of the prior art by prior use. D1 could therefore indeed be considered to describe the prior art, and the citation of D1 in the patent was not a real error by the applicant. The Respondent went on to argue that documents D5 and D6 should not be admitted into the proceedings.

VIII   In a communication pursuant to Article 11(2) EPC of the Rules of Procedure of the Boards of Appeal, dated 7 April 1994, the Rapporteur indicated that the issue of the admissibility of documents D4 to D6 would have to be decided at the outset of the oral proceedings. It appeared however, in the light of the Proprietor's statement, that D1 could still be considered as describing the state of the art at the claimed priority date.

IX.   Oral proceedings were held on 26 September 1994. The admissibility of documents D4 to D6 was initially discussed, the Appellant requesting that they be admitted to the proceedings and the Respondent requesting that they be excluded. After hearing the arguments, the Board considered the matter and announced that they would be admitted.

The Appellant (Opponent) requested that the decision under appeal be set aside and the patent - insofar as it related to granted Claims 2 and 3 - be revoked. The Respondent (Proprietor) requested that the appeal be dismissed and the patent maintained unamended, alternatively that the case be remitted to the first instance.

X.   At the oral proceedings, the Appellant argued that the subject matter of Claims 2 and 3 was obvious in that the skilled person would have found it obvious to apply the

teaching of D5 to the disclosure of D1. This was also
the basis of his arguments for the admission of document
D5 into the proceedings. The argumentation can be
summarised as follows.

From D1 it was known to change a modem from a
transparent mode to a command mode by means of an escape
sequence of data signals. The device described in D1
would suffer the drawback that the escape sequence might
occur accidentally in data to be transmitted and that
therefore the modem might go into command mode when this
was not desired. This drawback would be self-evident.
Hence the technical problem, to eliminate or at least
minimise the frequency of spurious occurrences of the
escape sequence in the data stream presented to the data
input port, would be equally self-evident.

It was stated in the patent itself that it was known
that a modem might respond to commands received at the
telephone port (page 2 lines 45 and 46). The skilled
person would be aware of this and would therefore also
look for a solution to his problem in documents
concerning the signals received at the telephone port of
a modem. In particular he would consider the teaching of
D5.

D5 described an escape sequence received over the
telephone port of a modem and which caused the modem to
switch from a transparent mode to a second mode. The
second mode was a "command" mode since it carried out a
function test, which is one of the commands listed in
D1. The escape sequence consisted of suppressing the
carrier for a fixed period of time, followed by a
sequence of data signals, alternate mark ("1") and space
("0"), and finally a period of "no data" in the form of
a steady mark (i.e. continuous 1) pattern. The period
during which the carrier was suppressed was considered

equivalent to a period of "no data" since in the patent the preferred embodiment used an RS-232C standard serial port; in that standard a lack of signal on the data input port is considered equivalent to a "no data" state.

No inventive activity on the part of the skilled person was necessary in order to arrange for the modem described in D1 to react to a sequence arriving on the data input port in the same way as D5 teaches for the telephone port. The subject-matter of both Claims 2 and 3 accordingly lacked an inventive step.

XI.   The Respondent's counter-arguments may be summarised as follows.

D5 was no more relevant than D2, which had already been dealt with in the opposition decision. Like D2 it showed a change of mode resulting from a sequence including a period of "no transmitted energy" and was not so relevant as to constitute a basis for overturning the decision, even in combination with D1. It should not therefore be admitted to the proceedings.

As to inventive step, the arguments used by the Appellant whether based on D2 or D5 were the result of an ex post facto analysis.

The problem itself was not known from any of the prior art documents to hand. This indicated that it was not obvious. In particular neither D1 nor D5 gave any hint of the problem or its solution. Even if the problem were recognised, the obvious solution was to lengthen the data pattern used as the escape sequence. It was part of the inventive activity of the inventor to recognise that this solution was deficient and develop another more satisfactory solution.

The data input port of a modem operated digitally, whereas the telephone port operated in the analog realm. The skilled person would not be motivated to apply a teaching related to analog signals received over the telephone port to a problem concerning the digital signals received over the data input port. Hence he would not even consider D5. Further, the second mode of operation of the modem in D5 was not a "command mode", the modem continuing to be in a receiving mode but, instead of passing the data on, reflecting it back onto the line in a "loop-back" mode, so that the remote modem could test the quality of the line.

Even if the skilled person were to consider D5, he would reject its teaching as inapplicable to the problem. The "escape sequence" described in D5 required cutting off the carrier for a fixed length of time. No equivalent signalling mechanism was identifiable in the digital line between a utilisation device and the data input port of a modem as in the patent.

Supposing that the skilled person were to generalise the solution of D5, he would still require three different signalling states. At best he would come to the idea of replacing the first state in D5 ("no energy") by a continuous "0" signal. But this signal would cause the connection to be broken, since it has generally been adopted (under the name of "Break") as a signal used for that purpose in telephone networks. Hence for this reason also he would reject the teaching of D5.

Reasons for the Decision

1.   The appeal is admissible.

2.   *The closest prior art*

2.1   Rule 27(1)(b) EPC indicates that the description shall
        "indicate the background art which, as far as known to
        the applicant, can be regarded as useful ... for the
        examination, and, preferably, cite the documents
        reflecting such art". Article 54(2) EPC indicates that
        "the state of the art shall be held to comprise
        everything made available to the public ... by use, ...
        before the date of filing" (implying, when appropriate,
        the priority date).

2.2   The Appellant (Opponent) has pointed out that the
        document D1 cited in the patent was not published before
        the claimed priority date and thus does not constitute
        background art within the meaning of Rule 27(1)(b) EPC.
        However, there is no mandatory requirement that this art
        be disclosed in a document; the Respondent's statement
        in the course of the appeal proceedings that a modem
        corresponding to the device described in D1 was on sale
        in the USA before the priority date of the contested
        patent (see VII above) is in the circumstances
        sufficient proof that it had been made available to the
        public by prior public use.

3.   *Admissibility of the late-filed documents*

3.1   With regard to D5, it is apparent that this document
        describes a so-called "escape sequence" closer to what
        is claimed than the earlier-submitted document D2. In
        order to ascertain its relevance the Board has been
        obliged to make a detailed analysis of its disclosure;

moreover, the parties devoted a major proportion of the oral proceedings to discussing D5. These facts make clear that a considerable effort has been expended by all sides in an analysis of D5. The degree of analysis which has been necessary in order to establish whether or not its disclosure is such as to justify setting aside the decision of the first instance means that in practice it has been treated in the same way as documents which are already part of the proceedings. In the absence of any indication of a wilful abuse of procedure the Board is of the opinion that in the circumstances it would be artificial to ignore D5 in the present decision.

3.2   The mere fact that a late-filed document is admitted to the proceedings does not mean that the case must automatically be remitted to the first instance for further consideration. It is the established jurisprudence of the Boards of Appeal that where the Board comes to the conclusion that the document is not such as to prejudice the maintenance of the patent, the Board may itself examine and decide the matter under Article 111(1) EPC (T 326/87 OJ92,522 Reasons 2.2; T 416/87 OJ90,415 Reasons 9).

3.3   In the light of these considerations the Board has admitted document D5 to the proceedings.

3.4   Documents D4 and D6 have not proved to be of importance to the current decision. However, the Appellant having maintained his request for the admission of these documents the Board decided in the oral proceedings to use its discretion in the exercise of Article 114(2) EPC to admit them together with D5 in the interests of procedural economy.

4.   *Interpretation of the claims*

4.1   The Appellant has suggested that the requirement in
      Claims 2 and 3 that "none of said data signals are
      provided to said data input port" would be satisfied by
      the absence of any signal at the data input port of the
      modem during one or both of the specified time periods.

4.2   It is first to be noted that the reference to "said data
      signals" refers back to "a transparent mode of operation
      for which said modem provides modulated signals to said
      telephone port in response to data signals provided to
      said data input port". The data signals are therefore
      signals which may be translated by the modem to provide
      modulated signals, i.e. sequences of 1's and 0's. In the
      course of the oral proceedings it became clear that the
      skilled person would understand that in the event of a
      "no data" condition existing between a utilisation
      device and a modem to which it is connected and to which
      the connection is to be maintained, the utilisation
      device will present a continuous "1" signal, also known
      as "steady mark", to the modem. In the RS-232C standard
      which underlies the preferred embodiment in the
      contested patent (see page 3 lines 59 to 65) the "mark"
      signal is a potential between -3 and -15 volts
      (generally -12V) and the "0" or "space" signal lies
      between +3V and +15V (generally +12V). Thus in normal
      operation no provision is made for the absence of a
      signal, i.e. 0V.

4.3   The Appellant has pointed out that according to the RS-
      232C standard the absence of a signal, i.e. 0V, is
      treated as a steady mark state; in this case the absence
      of a signal is equivalent to no data being transmitted
      from the utilisation device to the modem. However even
      if this were the case it is evident that the absence of
      any signal would be understood by the skilled person to

be an abnormal state which should be avoided if at all
possible. There is no suggestion in the patent that the
"predetermined time during which none of said data
signals are provided to said data input port" is
intended to indicate or encompass such an abnormal
state. Even if, as asserted by the Appellant, the
relevant standard specifies that this abnormal state
should be treated as a mark signal, it does not follow
that the skilled person would interpret the claims as
encompassing the action of putting the data input port
into this state for a certain period of time. Rather,
the Board understands the claims to refer to periods
during which the input data port is supplied with a
constant mark signal, in the case of the preferred RS-
232C standard a mark being a continuous -12V signal as
indicated above.

5.   *Inventive step*

5.1   The prior art modem as described in D1 indicates that at
       the claimed priority date it was known to change from a
       transparent mode to a command mode by means of an escape
       sequence of data signals received at the data input port
       (column 8 line 16 ff.). One of the commands of the
       command mode is a function test (column 4 line 41, "T =
       self test"). The device described in D1 suffers the
       drawback that the escape sequence could occur
       accidentally in data to be transmitted so that the modem
       would switch into command mode when this is not desired.

5.2   The problem to be solved is thus to avoid the accidental
       appearance of the "escape sequence" in the data stream,
       leading to unwanted entry into command mode. The Board
       is inclined to agree with the Appellant that this
       problem would be faced by the user of the prior art
       device. The Board is further not convinced by the
       Respondent's view that the obvious solution to the

problem is to provide a more complicated bit pattern. It
would seem that such a solution would merely reduce the
chance of accidental entry into the command mode rather
than preventing it completely and would not prevent
entry in the special case of transmission of a document
about the modem itself in which the data sequence is
described. The skilled person would thus be led to look
for an alternative solution.

5.3   D5 discloses a pair of full-duplex modems connected by a
telephone line, with a facility for remotely initiating
loop-back on one of them for testing purposes. This
involves sending a signal which takes advantage of the
particular characteristics of data transmission by
telephone line, a continuous carrier signal being
transmitted and being frequency-shifted in response to
the data. In accordance with column 9 line 55 to
column 10 line 14 the initiating modem "squelches" the
transmitter for a predetermined period, thereby
interrupting the carrier, so that at the receiving modem
energy detect and received line signal detect outputs
are lost. Thereafter the carrier is revived and a
predetermined bit pattern is transmitted for a further
predetermined period, followed by a mark pattern. After
the test signal is transmitted the loop-back is ended by
a further "squelching" of the transmitted signal. From
D5 the skilled person would learn the possibility of
switching a modem from one mode to another, in this case
from a "transparent" mode to a loop-back mode, in
response to a sequence of events or signals received at
its telephone port. This change of mode is analogous to
the change caused in the device of D1 when the escape
sequence is received at the data input port. Hence the
skilled person would be led by D5 to consider whether
the signals triggering an exit from the transparent mode
into another mode in D5 might be adapted to the data

input port to provide an improved escape sequence for
the device described in D1.

5.4   The "escape sequence" of D5 consists of three phases,
       requiring three different signals or events: a loss of
       carrier or energy for 50ms, a predetermined bit pattern
       and finally a steady mark pattern for 200ms. It is clear
       from column 9 line 52 to column 10 line 43 of D5 that
       all of these phases and events are essential in order
       for the circuitry of the modem to respond to the
       sequence. Moreover, the skilled person would be aware
       that the first phase - no carrier - is specific to data
       transmission by telephone line and has no direct
       equivalent in the baseband transmission of a data
       stream. The closest direct equivalent in serial data
       transmission using the RS-232C standard would, as noted
       above, be the 0V state, an abnormal state which the
       skilled person would not choose to use. If the skilled
       person were to seek to apply telephone line teaching to
       a digital port he would, as suggested by the Respondent,
       rather see the "no carrier" condition as a "break"
       condition in which the signal path is cleared after a
       predetermined time. It does not therefore appear to the
       Board that it would be obvious for the skilled person
       that the "no carrier" condition known from D5 could be
       applied directly to a serial data port as known from D1.

5.5   The second and third phases of this escape sequence, the
       bit pattern and the steady mark, can be implemented at
       the data input port of a modem, as opposed to the
       telephone port. However, the steady mark serves to
       restore a line signal detect input in order to initiate
       loopback; there is no means for detecting each
       occurrence of a predetermined passage of time as
       required by Claim 2 of the patent.

5.6   Hence the Board concludes that the skilled person faced
        with the problem of changing modes in a reliable manner
        would, if he modified the D1 modem in accordance with
        the disclosure of D5, not arrive at the subject-matter
        of Claim 2 or Claim 3 without the exercise of invention.

5.7   Nor does the Board consider that the skilled person
        would arrive at the claimed subject-matter starting out
        from different documents. D2 is concerned with
        activating a modem and with send/receive turnaround, by
        means of signals sent over a telephone line. From
        section 2.5.1 at page 150 and Table 3 at page 151 it
        appears that the longer sequences - for activation - are
        in five segments, the first two of which are an
        unmodulated carrier for 185-200ms followed by no
        transmitted energy for 20-25ms. However, it seems from
        Table 3 that these first two segments can be dispensed
        with if protection against talker echo is not required.
        The transmitted signals rather have the character of
        synchronizing signals and are described as being "for
        proper conditioning of the receiving modem" rather than
        for switching from a transparent to a command mode.
        Moreover, the "no transmitted energy" condition has no
        equivalent in the connection of a modem to a data port
        and the above comments on D5 in this connection appear
        applicable to D2.

6.   Thus no grounds have been established for overturning
        the decision of the Opposition Division.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl   P. K. J. van den Berg