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D E C I S I O N
of 13 May 2004

Case Number: T 0287/01 - 3.5.3

Application Number: 95915934.4

Publication Number: 0756785

IPC: H04B 3/54

Language of the proceedings: EN

Title of invention:
Hybrid electricity and telecommunications distribution network

Patentee:
Amperion, Inc.

Opponents:
ABB Schweiz AG
Siemens AG

Headword:
Hybrid distribution network/AMPERION

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

Keyword:
"Inventive step - yes (after amendment)"
"Late filed material - admitted (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0287/01 - 3.5.3

D E C I S I O N
of the Technical Board of Appeal 3.5.3
of 13 May 2004

Appellant 1: (Proprietor of the patent)
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Respondent: (Opponent 1)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 12 January 2001 concerning maintenance of European patent No. 0756785 in amended form.

Composition of the Board:

Chairman: A. S. Clelland
Members: F. van der Voort
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. This appeal is against the decision of the opposition division finding European patent No. 0 756 785 in amended form to meet the requirements of the EPC.

II. Opponents 1 and 2 had filed an opposition against the patent as a whole and on the grounds as set out in Article 100(a) EPC. In the opposition proceedings, the opponents referred *inter alia* to the following prior art documents:

D1: US 4749992 A;

D4: US 4636771 A;

D5: US 4772870 A; and

D6: M. Tanaka, "High Frequency Noise Power Spectrum, Impedance and Transmission Loss of Power Line in Japan on Intrabuilding Power Line Communications", IEEE Transactions on Consumer Electronics, Vol. 34, No. 2, May 1988, p. 321 - 326.

III. Following oral proceedings, the opposition division held that the subject-matter of claim 1 of a main request and of a second auxiliary request lacked novelty having regard to the disclosure of D1, that the subject-matter of claim 1 of a first auxiliary request lacked an inventive step having regard to the disclosure of D4, and that the subject-matter of independent claims 1 and 5 of a third auxiliary request involved an inventive step.

IV. Both the proprietor (appellant 1) and opponent 2 (appellant 2) lodged an appeal against the decision. With their statement of grounds of appeal, appellant 1 requested that the impugned decision be set aside and that the patent be maintained either as granted (main request) or in a form according to the first auxiliary request as filed during the opposition procedure (auxiliary request). Appellant 2 with their statement of grounds requested that the impugned decision be set aside and that the patent be revoked in its entirety. In support of their arguments, appellant 2 filed the following documents:

D9: M. Tanaka, "Transmission Characteristics of a Power Line used for Data Communications at High Frequencies", IEEE Transactions on Consumer Electronics, Vol. 35, No. 1, February 1989, p. 37 - 42;

D10: US 5066939 A; and

D11: EP 0470185 B.

Both appellants conditionally requested oral proceedings.

V. The parties were summoned by the Board to oral proceedings. In a communication accompanying the summons, the Board gave a preliminary opinion.

VI. In response to the Board's communication, appellant 1 filed a new main request and a plurality of auxiliary requests, replacing the requests as filed with the

statement of grounds. Further, arguments as to their allowability were presented.

VII. Oral proceedings were held on 13 May 2004 during which appellant 1 withdrew all existing requests and filed a single request including two independent claims 1 and 5. At the end of the oral proceedings the chairman announced the Board's decision.

VIII. The arguments against the maintenance of the patent given by appellant 2 during the oral proceedings may be summarized as follows. The subject-matter of claim 1 lacked an inventive step having regard to a combination of D5 and D1. In particular, starting from D5 as representing the closest prior art, it would have been obvious for a person skilled in the art to use an in-building power line carrier (PLC) communications system for the transmission of a telecommunications signal between two separated buildings and, in case of the buildings being far apart, to use a cable TV line, i.e. a broadband telecommunication network, for the long-distance transmission of the telecommunications signal between the buildings as taught by D1 (Figure 1, column 1, lines 63 to 66, column 2, lines 41 to 54).

Further, appellant 2 argued that the system disclosed in D1, forming a star network with a central control unit 1 in the embodiment illustrated in Figure 1, permitted the transmission of a telecommunications signal between two local sites via the central control unit 1, in a way similar to that in the communications system as disclosed in Figure 1 of D4, in which two subscribers, connected to the same power line 10, e.g. S3 and S4, or each connected to a different power line,

may communicate via the central office terminal 14 and the conventional telephone system 16.

IX. Appellant 1 essentially argued that D5 was concerned with an in-building point-to-point PLC communications system, there being no need to introduce a section of a broadband telecommunications network in place of the shielded AC power line 13 carrying the telecommunications signal (Figure 1). Furthermore, since the system according to D5 aimed at providing a telecommunications system which used the AC wiring system inside the building in order to avoid the necessity of providing a broadband telecommunications network, D5 taught away from the introduction of such a network.

X. Appellant 1 requested the Board to maintain the patent on the basis of claims 1 and 5 as filed during the oral proceedings and claims 2 to 4 as granted and further requested the Board not to admit documents D9 to D11. Appellant 2 requested that the impugned decision be set aside and that the patent be revoked in its entirety.

XI. Claim 1 as filed during the oral proceedings reads as follows:

"A network linking a plurality of premises (142), comprising:

a section of broadband telecommunications network (130) and

a plurality of electrical power cables (134) each connected to a respective one of the premises for supplying mains electrical power thereto, and each being entirely external to said plurality of premises,

each of said power cables also being connected to the section of broadband telecommunications network so that telecommunications signals are transmissible between the section of broadband telecommunications network and each of said power cables,

input means for the input on to one of the power cables of a telecommunications signal having a carrier frequency greater than 1MHz and output means for removing said telecommunications signal from one of the power cables,

wherein the telecommunications signal is transmissible from a first one of said plurality of premises to a second one of said plurality of premises by being transmitted along the power cable of the first premises, followed by the section of broadband telecommunications network and followed by the power cable of the second premises."

Claim 5 as filed during the oral proceedings reads as follows:

"A method of transmitting a telecommunications signal between a pair of buildings, including the steps of:

(i) transmitting the signal from a first building along an external power cable for supplying mains power to the first building, followed by

(ii) transmitting the signal along a section of broadband telecommunications network, followed by

(iii) transmitting the signal along a second external power cable for supplying mains electrical power to the second building,

wherein the carrier frequency of said telecommunications signal is at least 1MHz."

Reasons for the Decision

1. *Admissibility of documents D9 to D11*

1.1 At the oral proceedings appellant 2 submitted that documents D9 to D11 were merely cited as supplementary evidence in support of their allegation that the subject-matter as found by the opposition division to meet the requirements of the EPC, lacked an inventive step for the reasons as set out in their statement of grounds of appeal. Further, as set out in their statement of grounds of appeal (page 2, point 1, last paragraph), D9 to D11 were deemed relevant to the extent that they reflected the knowledge of a skilled person in the field of power line communication before the priority date of the contested patent.

1.2 In accordance with Article 114(2) EPC, the Board may disregard facts or evidence which are not submitted in due time. In the present case, no specific reasons were put forward to justify the late filing. Further, the Board notes that the disclosure of D9 is very similar to that of D6 (by the same author), that D10 does not seem to be more pertinent than other documents on file relating to in-house power line carrier (PLC) communication systems (for example, D5), and that, as already pointed out in the Board's communication, D11 does not constitute prior art within the meaning of Article 54(2) EPC. The Board therefore considers documents D9 to D11 not to be *prima facie* highly relevant in the sense that any one of these documents would be highly likely to prejudice maintenance of the patent.

1.3 Documents D9 to D11 are therefore not admitted.

2. *Amendments*

The Board is satisfied that the amendments made to the claims do not give rise to objection under Article 84 EPC, that the claims do not contain subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC) and that the scope of protection has not been extended during the opposition and appeal proceedings (Article 123(3) EPC). No objection under these articles was raised by any of the parties during the opposition and appeal proceedings.

3. *Inventive step*

3.1 At the oral proceedings documents D1, D4 and D5 were referred to by appellant 2 in relation to claims 1 and 5 as filed during the oral proceedings. In the Board's view, none of these documents or any combination thereof renders the subject-matter of claims 1 and 5 obvious. The reasons are as follows.

3.2 Document D5 was considered by appellant 2 to represent the closest prior art (see point VIII). This document discloses an RF communications system including a network linking two locations in a building (see, in particular, Figure 1 and the abstract). The network includes input means 11, 21 (see Figures 1 and 2) at the first location for the input of a broadband RF telecommunications signal, e.g. a video signal, having a carrier frequency greater than 1 MHz (column 3, lines 18 to 23) on to the AC wiring system of the

building and output means 12, 25 (Figures 1 and 3) at the second location for removing the telecommunications signal from the AC wiring system.

3.3 The subject-matter of claim 1 differs from the system disclosed in D5 in that:

(i) the network links at least two premises;

(ii) the network includes a plurality of electrical power cables connected to a respective one of the premises and entirely external to the premises; and

(iii) the power cables are each connected to a section of broadband telecommunications network, wherein the telecommunications signal is transmissible from the first premises to the second premises by being transmitted along the power cable of the first premises, followed by a section of broadband telecommunications network, and followed by the power cable of the second premises.

3.4 The provision of a section of broadband telecommunications network allows for the propagation of the broadband telecommunications signal over a distance longer than would have been possible if only electrical power cables were used, since at a carrier frequency greater than 1 MHz, attenuation effects in power cables limit the distance over which the signal can be transmitted (see also the patent specification, column 1, lines 35 to 46).

3.5 The problem underlying the present invention may therefore be seen as modifying the system disclosed in D5 such as to permit broadband signal transmission over longer distances.

3.6 In the Board's view, it would have been obvious for a person skilled in the art to use the system according to D5 for linking two nearby premises, e.g. a central building and an outbuilding (e.g. a dwelling and a shed), since such a use would not present any unexpected technical problems to be overcome. The AC wiring system would in such a case include at least one external electrical power cable, the ends being connected to a respective one of the premises.

However, there is no suggestion in D5 to insert a section of a broadband telecommunications network into such an external electrical power cable in a way similar to that as defined by feature (iii). In the Board's view, removing (part of) the external electrical power cable would be seen by the skilled person as going against the purpose of providing the external power cable in the first place, which is to supply electrical power to the outbuilding.

Further, the Board notes that although the use of a telephone line as a transmission medium is mentioned in D5 (column 4, lines 61 to 64, and column 5, lines 30 to 47), this is merely described as an alternative for the AC wiring system and therefore teaches away from making any combination of the telephone line and the AC wiring system.

Hence, D5 neither discloses nor suggests a transmission path for the telecommunications signal comprising the combination of a power cable, a section of broadband telecommunications network, and a further power cable, as defined by feature (iii).

3.7 Neither is feature (iii) disclosed by D1 or D4:

3.7.1 D1 (see, in particular, the abstract and column 1, lines 39 to 41 and 49 to 54) discloses a system for measuring power consumption of distributed units at local sites and for controlling power availability to those units. The system is centrally controlled by central control unit 1 (Figure 1), which receives and transmits data signals from/to local relay modules 2 at the local sites via, for example, cable TV lines (column 1, lines 63 to 65). Each relay module, in turn, receives and transmits data signals from/to its corresponding site units 8, 9, 10 via a power line 34 (Figures 1 and 3). The transmission path for the data signals from a site unit to the central control unit thus only includes a power line and a broadband telecommunications network formed by the TV cable lines. A communication between two relay modules or between site units of different user sites is not provided for and in view of the above-mentioned purpose of the system would not be desirable. Hence, D1 does not disclose feature (iii).

3.7.2 D4 (see, in particular, Figure 1 and column 1, lines 16 to 20) relates to a system for use in a sparsely populated region, in which a telephone communication between a subscriber terminal S1, ..., Sn (see Figure 1) and a receiving party is established via a power line

10 connected both to the subscriber terminal and to a central office terminal 14, which is in turn connected to a conventional telephone system 16 to which the receiving party is connected (see column 3, lines 48 to 62). The central office terminal 14 recognizes and accepts the carrier frequency signal assigned to a subscriber terminal for the transmission of its voice signal over the power line (column 3, lines 29 to 40 and 48 to 62) and converts it to a conventional voice signal, which is coupled to the conventional telephone system 16 for transmission to the receiving party over conventional telephone lines (column 3, lines 58 to 62). D4 does not give further details on the connection between the telephone system 16 and the receiving party. Hence, D4 does not disclose feature (iii) either.

3.7.3 It follows that, starting from D5, neither the combination of D5 and D1 nor that of D5 and D4 discloses or suggests the inclusion of feature (iii) into the system disclosed in D5.

3.8 Having noted that in their statement of grounds of appeal, appellant 2 also considered D1 and D4 as starting points for an inventive step objection against the claims on file at the time, the Board also considered the question of inventive step in respect of the present claims using either D1 or D4 as starting point.

3.9 Starting from D4 first, one of the distinguishing features is that there is provided a section of broadband telecommunications network capable of transmitting a telecommunications signal having a carrier frequency greater than 1 MHz (see point 3.7.2

above). This, in accordance with the patent in suit, has the effect that broadband signals, such as television signals, may be transmitted over the network linking the premises (see the patent specification, column 1, lines 54 to 55).

Faced with the underlying problem of modifying the system according to D4 such as to allow for the transmission of signals other than voice signals, the skilled person would not find the proposed solution in D1 or D5:

The system of D1 uses carrier frequencies of 180 and 200 kHz or lower for the transmission of the digital data representing status and utility use signals (column 5, lines 7 to 14, column 6, lines 24 to 26). These signals are small-band signals. Consequently, D1 does not hint at using a carrier frequency greater than 1 MHz on the power cables.

D5 relates to an in-house point-to-point communication system, whereas D4 relates to an open telephone communication system, in which the subscriber terminals may be separated by distances of miles (column 1, lines 16 to 20, and column 3, lines 1 to 2). If, nevertheless, the skilled person were to apply the teaching of D5, according to which broadband (TV) signals are transmitted by means of a power communication system (PLC) at a carrier frequency within the range of 50 to 600 MHz (D5, the abstract), to the system according to D4, he would, in the Board's view, apply it to one or more of the subscriber terminals S1, .., Sn individually, *i.e.* at the

respective premises only, without achieving any broadband communication between the different premises.

3.10 Starting alternatively from D1, in view of the purpose of the system of D1 (see point 3.7.1), in order to arrive at the claimed subject-matter, it would have been necessary to extend the transmission path by the inclusion of a second external power cable at the other end of the broadband cable TV lines, i.e. at, but still outside, the central control unit 1 forming the second premises. Such feature is neither disclosed nor suggested by D4 (cf. Figure 1: central office terminal 14, conventional telephone system 16) or D5 (in-house communication only).

3.11 It follows that the subject-matter of claim 1 involves an inventive step having regard to D1, D4, D5 or any combination thereof (Articles 52(1) and 56 EPC). The same reasoning applies *mutatis mutandis* to claim 5, defining method steps corresponding to the constructional features of claim 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of the following documents:

   – claims 1 and 5 as filed during the oral proceedings (see point XI), claims 2 to 4 as granted;

   – description as amended during the oral proceedings before the opposition division;

   – Figures as granted.

The Registrar: The Chairman:

A. Wolinski A. S. Clelland