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**Datasheet for the decision
of 21 August 2007**

Case Number: T 1795/06 - 3.5.03

Application Number: 95935092.7

Publication Number: 0783813

IPC: H04M 3/30

Language of the proceedings: EN

Title of invention:

Method and apparatus for fault segmentation in a telephone network

Applicant:

Teradyne, Inc.

Opponent:

-

Headword:

Fault segmentation in a telephone network/TERADYNE

Relevant legal provisions:

EPC Art. 83

Keyword:

"Disclosure - sufficiency - (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 1795/06 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 21 August 2007

Appellant: Teradyne, Inc.
321 Harrison Avenue
Boston, Massachusetts 02118 (US)

Representative: Luckhurst, Anthony Henry William
Marks & Clerk
90 Long Acre
London WC2E 9RA (GB)

Decision under appeal: Decision of the examining division of the
European Patent Office posted 6 July 2006
refusing European application No. 95935092.7
pursuant to Article 97(1) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse European patent application No. 95935092.7, publication No. EP 0783813, which was originally filed as international application PCT/US95/12195, publication No. WO 96/10890 A.

The reason for the refusal was that the subject-matter of claim 1 of a main request and each of three auxiliary requests lacked an inventive step, Article 56 EPC.

II. The following document, which was cited in the international search report relating to the present application, is referred to in the present decision:

D6: R.H.T. Cartwright, "4TEL AUTOMATED SUBSCRIBER LINE TEST SYSTEM", Proceedings of the International Symposium on Subscriber Loops and Services, 20 September 1982, Toronto (CA), pages 152 to 155.

III. In the statement of grounds of appeal the appellant presented arguments in support of the claims of the requests on file. Oral proceedings were conditionally requested.

IV. The appellant was summoned to oral proceedings. In a communication accompanying the summons, the board raised, without prejudice to the board's final decision, objections under Articles 56 and 123(2) EPC.

V. In preparation for the oral proceedings, the appellant filed with a letter received on 14 August 2007 an amended main request and arguments in support.

VI. Oral proceedings were held on 21 August 2007. In the course of the oral proceedings the appellant withdrew the requests on file and filed a new claim 1. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claim 1 as filed during the oral proceedings and claims 3 to 15 as filed on 14 August 2007.

At the end of the oral proceedings the chairman announced the board's decision.

VII. Claim 1 reads as follows:

"A system comprising:

switching equipment (106) for connecting subscriber lines (108) to other parts of the network;

a plurality of subscriber lines (108) terminating in premises wiring (116); and

apparatus for segmenting faults in the telephone network comprising:

memory means (136, 138) configured to store parameters characterizing a plurality of subscriber lines at a first time;

measuring means (120, 126) connected to the switching equipment (106) and configured to measure parameters characterizing the selected subscriber line (108) at a second time, such that a fault has occurred between the first and second times; and

control means (132), connected to the memory means and the measuring means, configured to compare the stored parameters with parameters measured on the selected subscriber line at the second time, and to distinguish between faults in the premises wiring and

faults in other parts of said telephone network based on the change in the parameters by performing a knowledge based analysis."

Reasons for the Decision

1. *Article 83 EPC*

1.1 The application does not comply with the requirements of Article 83 EPC for the following reasons.

1.2 The present application relates to a system for testing telephone lines and more specifically to an apparatus for locating a fault in the telephone network. At page 2, line 10 to 27 of the published PCT application, it is stated that telephone companies use automated test equipment to help in identifying these faults, of which the commercially available 4TEL[®] test system is said to be an example. This system includes several measurement devices for measuring various parameters of the subscriber line. A computer is programmed to analyse the parameters by comparing them to values which would be expected for a good line. If the measured values are outside an acceptable range, a fault is detected.

Further, at page 3, lines 15 to 20, current automatic telephone line test equipment is said to be capable of reporting whether the fault is most likely in the central office, the cable and the station (board's emphasis), in which the "cable" refers to the cables routing the pairs of subscriber lines within the telephone company's service area and the "station" refers to the subscriber line as it leaves the cable and

runs into the customer's premises (page 2, lines 30 to 36). This determination of the location of a fault is referred to in the application as "segmentation" and is performed by observing which of the measured parameters of the line deviates from the expected values.

The above-mentioned 4TEL[®] test system is also described in document D6. At page 153, right-hand column, 2nd paragraph, of D6, the measurement data is said to be processed by software resident in the system. The data is subjected to statistical analysis and pattern analysis before a decision is reached about the nature of a fault and the most likely part of the network affected (board's emphasis), e.g., the exchange, cable or station. The diagnostic software is said to be refined as a result of some eight years of field experience. With the 4TEL[®] test system automatic measurement data processing can be performed in order to achieve a consistently accurate fault distribution, independent of varying levels of skill among testmen (see D6, page 153, last paragraph and Fig. 3). In the board's view, this implies that the analysis performed by the diagnostic software is a knowledge based analysis.

- 1.3 At page 3, lines 3 to 12, of the present application, it is said that a time domain reflectometry (TDR) unit may be used to locate a fault to within a section of cable, whilst at page 4, line 17 to page 5, line 3, it is said that a remote isolation device (RID), i.e. a remotely controlled switch, can be installed at the interface between the premises wiring and the drop, i.e. the point at which the subscriber line passes out of the control of the telephone company and becomes the responsibility of the customer, in which the "drop" is that part of the

subscriber line which connects the premises wiring to the cable running from the central office to near the subscriber's premises (page 3, lines 23 to 30). Such an RID makes it possible to distinguish between a fault within the customer premises or elsewhere in the telephone network. When the RID receives a command from the automatic line test system, it disconnects the premises wiring from the drop. The automatic line tester may then retest the line with the premises wiring disconnected. If the fault persists, it can be excluded from being within the premises wiring. Because each subscriber line must include its own RID, a telephone company would have to buy between tens of thousands and millions of RIDs, which is expensive.

1.4 The aim of the invention is to provide an alternative solution, i.e. without RIDs being required, for locating a fault on a subscriber line at least to the level that the telephone company can know with high confidence whether the fault is in the premises wiring or in another part of the telephone network, in particular the drop (board's emphasis, see page 5, lines 3 to 7, page 6, lines 6 and 7, and page 12, lines 3 to 7). Accordingly, both in the letter received on 14 August 2007 and at the oral proceedings, the appellant emphasized that the object of the invention is to provide an apparatus for determining whether a fault is located in the drop or within the subscriber premises.

1.5 The proposed solution according to claim 1 includes the provision of a control means configured to distinguish between faults in the premises wiring and faults in other parts of said telephone network based on comparing stored parameters with measured parameters by performing

a knowledge based analysis.

- 1.6 The board notes however that in the application as filed the knowledge based analysis, the implementing software of which is also referred to as a plurality of "expert systems", is only capable of outputting a "prediction" of fault location and whether it is "most likely" in the central office, the cable, the drop or the customer premises (see page 6, lines 27 to 31, page 21, lines 17 to 25, page 29, lines 25 to 32, page 30, lines 12 to 20, page 35, lines 25 and 26, Fig. 2B ("knowledge based analysis 260"), Figs 3A and 3B and claims 7 to 9 as originally filed). Similarly, in the rule based classifier, which is part of the expert system software, a "certainty factor" is assigned to each rule and an "overall certainty factor" is produced (see page 22, lines 31 to 33, and page 23, lines 11 to 32). Similarly, at page 26, lines 17 to 23, reference is made to a "probability vector", and at page 27, lines 11 to 18, reference is made to "confidence metrics". Further, in relation to the measurement accuracy, reference is made to a "confidence factor", see page 32, lines 29 to 32.
- 1.7 Since the described knowledge based analysis merely provides a prediction of the fault location and since claim 1 does not require the presence of RIDs and/or a TDR unit (see point 1.3 above), the application as originally filed does not teach the skilled person how to put the claimed system into practice over the whole scope of the claim, in particular in systems without RIDs and/or a TDR unit. More specifically, it does not enable the skilled person to implement the control means as defined in claim 1, so as to distinguish between faults in the premises wiring and faults in other parts of the telephone

network based on the change in the parameters by performing a knowledge based analysis. The difference in distance from the central office between a fault which is located within the premises and a fault which is located outside the premises, for example in the drop, may be extremely small, e.g. in the order of centimetres, compared to the average distance, e.g. several kilometres, between the central office and the premises served by the central office. There is no disclosure in the application as to how, in the absence of RIDs an/or a TDR unit, such distances might be measured.

Further, if a set of facts, assumptions, and/or inference rules derived from human knowledge, in which this set is suitable for determining whether or not a fault is within or outside the premises, were to exist, in the board's view, due to its specific character, the existence of this set must be considered as going well beyond the common general knowledge available to the skilled person.

Consequently, even if the skilled person were to use his common general knowledge to supplement the information contained in the application, he would not be able to carry out the invention.

- 1.8 At the oral proceedings the appellant submitted that a skilled person would know how to implement the claimed system. However, the appellant did not provide any evidence, e.g. a textbook or any other general technical literature, in support of this assertion.
- 1.9 The board therefore concludes that the system of claim 1 is not disclosed in the application as filed in a manner sufficiently clear and complete for it to be carried out

by a person skilled in the art. The application does not therefore comply with the requirements of Article 83 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Magliano

A. S. Clelland