

Publication in the Official Journal ~~Yes~~ / No

File Number: T 646/90 - 3.5.2

Application No.: 84 115 204.4

Publication No.: 0 185 777

Title of invention: Safety circuit system for overvoltage protection
of multi-wire lines

Classification: H02H 9/04

D E C I S I O N
of 20 February 1991

Applicant: F.I.T.R.E. S.P.A.

Headword:

EPC Articles 56, 123(2)

Keyword: "Inventive step (no)"

Headnote



((2))

Case Number : T 646/90 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 20 February 1991

Appellant :

F.I.T.R.E. S.P.A.
Via Valsolda No. 15
I-20143 Milano
ITALY

Representative :

Ing. Luigi Coloberti
Via E. De Amicis No. 25
I-20123 Milano
ITALY

Decision under appeal :

Decision of Examining Division of the European
Patent Office dated 14 March 1990 refusing
European patent application No. 84 115 204.4
pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : E. Persson
Members : A. Hagenbucher
J. Van Voorthuizen

Summary of Facts and Submissions

- I. European patent application No. 84 115 204.4 (publication No. 185 777) was refused by the Examining Division.
- II. This decision was based on two versions of Claim 1 of which the "main proposal" reads as follows:
 1. A safety circuit for protecting a line system comprising the earth, said safety circuit comprising a diode bridge (Dk, Dr) having a first set of directly polarized diodes (Dk) connected to line conductors (an, bn) and a second set of reversely polarized diodes (Dr), said second set of diodes (Dr) being reversely connected to line conductors (an, bn) in respect to diodes of said first set (Dk), and energy dispersing means (P1) designed for protecting an apparatus (U) connected to the line system against over-voltages occurring between the wires and between a wire and the earth, said energy dispersing means (P1) being disposed in a common diagonal of said bridge (Dk, Dr), said first and second sets (Dk, Dr) of diodes together with said energy dispersing means (P1) being connected to the earth (T) by a respective polarized diode (Dt, Dt'), characterized in that said line system is in the form of a multi-wire line system, and in that use is made of a common energy dispersing means comprising a single energy dispersing device (P1) connected to all wires (an, bn) of the line system and the earth by respective polarized diodes (Dr, Dk, Dt, Dt').

Claim 1 according to the "alternative proposal" differed from the "main proposal" only in that it excluded a thyristor to be used as an energy dispersing device.

III. The reason given for the refusal was that the claimed subject-matter lacked an inventive step having regard to the prior art known from the following documents:

D1: DE-B-2 034 392

D2: EP-A-0 050 034

D3: US-A-4 408 248.

IV. An appeal against this decision was lodged requesting the grant of a patent.

V. At oral proceedings before the Board the Appellant maintained Claim 1 according to the "main proposal" and filed a new alternative Claim 1, which contains the additional features that

(a) the line system is defined as comprising more than two conductors (cf. line 22),

(b) use is made of two separate diode bridges (D_X , D_Y) connected in cascade on the multi-wire line, each diode bridge comprising a single energy dispersing device (cf. lines 23 to 25) and

(c) that said energy dispersing devices are of different type (cf. lines 28 and 29).

Original Claims 2 to 11 were dropped at the oral proceedings.

VI. The Appellant has put forward essentially the following arguments:

The nearest state of the art was represented by document D3. Whilst document D3 concerned an over-current and over-voltage protection circuit for a two conductor

communication line, the subject-matter of the present patent application was concerned with the solution of a different problem, namely to design a cheap over-voltage protection system for a multi-wire line system, i.e. a line system with more than two wires.

Since the solution in document D3 provided over-current protection, which required an over-current detection circuit (OC1 and OC2) for each wire, it was clear to a person skilled in the art that applying the principles known from D3 to a multi-wire system would require the same number of safety circuits as that of the pairs of conductors which need protection. The use of a single energy dispersing device for a multi-wire line system would be in contradiction to D3, therefore. It was not allowable to derive from a document features which are incompatible with the whole disclosure of the document. Reference was in this context made to the Guidelines for Examination in the EPO, Part C, page 45.

A person skilled in the art would not consider the over-voltage protection circuit part of D3 in isolation and use it separately according to the teaching of D1, because D1 concerned a circuit for regulating output voltages but not a safety circuit for over-voltage protection.

Moreover, document D3 taught the use of a thyristor as an energy dispersing device. Such a thyristor device was not practical for the present invention, because it needed a control input. Regarding the new alternative Claim 1, the Appellant drew attention to the fact that the use of different types of energy dispersing devices in two separate diode bridges would allow mutual support and compensation.

Reasons for the Decision

1. The appeal is admissible.
2. Main Request
 - 2.1 The Board is in agreement with the Examining Division, that the subject-matter of Claim 1, being interpreted in the light of the description, differs from the over-voltage protection circuit as disclosed in D3, which represents the closest state of the art, only in that the claimed safety circuit is related to a multi-wire system, i.e. a line system with more than two wires.
 - 2.2 The problem underlying the present invention can be seen in modifying at low cost the over-voltage protection circuit known from D3 in such a way that it serves for a line system with more than two wires. This is achieved by adapting the number of bridge diodes of the diode bridge known from D3 to an indefinite number of wires, making use only of a single energy dispersing device in this bridge.
 - 2.3 However, as concluded in the decision under appeal, it would have been obvious to a person skilled in the art to arrive at this solution by applying the teaching of D1 (in particular Figure 2 thereof), i.e. the use of a diode bridge with only one energy dispersing device (Z3) and two sets of diodes (G1N, G2N) wherein the number of diodes corresponds to the number of wires of the line system, to the over-voltage protection circuit part of D3 and thereby provide an over-voltage protection circuit for a multi-wire line system as covered by the subject-matter of Claim 1.

2.4 Thus, the Board cannot accept the argument put forward by the Appellant that D3 as a whole pointed away from the claimed solution, because it provided, in addition to over-voltage protection, over-current protection requiring an over-current detection circuit (OC1, OC2) for each line, which, in the Appellant's view, suggested to use the same number of safety circuits as that of the pairs of conductors. In the Board's view, the skilled person would have realised that the over-voltage protection part of the circuit disclosed in D3 could evidently be used on its own when over-current protection was not of interest to him, the two circuit parts being technically so related as to be easily separable. This consideration is in no way contrary to the Guidelines for Examination in the EPO. Nor is the Appellant's argument concerning the use in D3 of a thyristor as an energy dispersing device relevant, since Claim 1 of the present application does not exclude the use of a thyristor. Regarding, finally, the Appellant's remarks on D1, it is to be noted that D1 concerns a voltage clipper circuit and not, as alleged by the Appellant, a voltage regulating circuit. Figure 1 and the description of D1 make it clear that, contrary to what is erroneously shown in Figure 2, the diodes of the two sets must have opposite polarisation directions.

2.5 It follows from these considerations that the subject-matter of Claim 1 is lacking an inventive step.

3. Auxiliary request

Claim 1 according to the auxiliary request defines in addition to the features of Claim 1 of the main request, *inter alia*, that two separate diode bridges are connected in cascade in a multi-wire line system and that the energy dispersing devices are of different type.

However, during the oral proceedings, the Appellant could not show any disclosure in the application as filed that the two separate diode bridges connected in cascade according to Figure 2 have energy dispersing devices of different type. The fact that the energy dispersing devices in Figure 2 are distinguished by an apostrophe is no indication of a different type. In the first part of page 7 of the description it is said that the embodiment shown in Figure 2 eliminates problems which may occur in the known systems as a result of possible differences in the characteristics of one protection device P and the other. This, however, appears clearly to refer to the use of a single dispersive device in each protection stage instead of several as taught by the prior art (cf. also Figure 1 where the dispersive devices are marked P). The Board is unable to find any support in the said passage for the use of dispersive devices of different type in cascaded protection stages.

Hence, it must be concluded that Claim 1 of the auxiliary request does contain subject-matter extending beyond the content of the application as filed. It is, therefore, not allowable (Article 123(2) EPC).

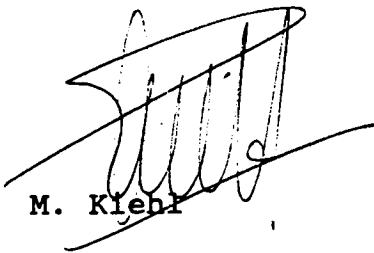
4. It follows from the foregoing that the subject-matter of the present European patent application according to the main request is not patentable within the terms of Article 52 and 56 EPC and that Claim 1 according to the auxiliary request is not allowable either. Consequently, the appeal has to be dismissed.

Order

For these reasons, it is decided that:

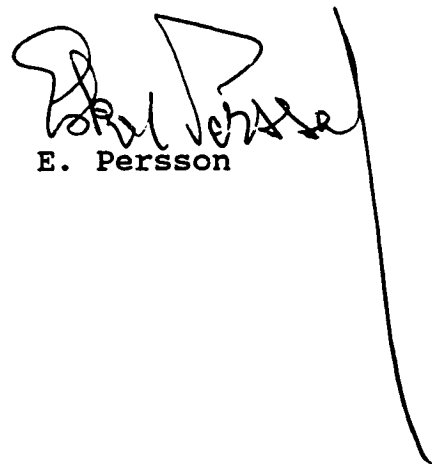
The appeal is dismissed.

The Registrar:



M. Kiehl

The Chairman:



E. Persson