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Anmeldenummer / Filing No / N^o de la demande : 81 108 566.1
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Bezeichnung der Erfindung: Method of generating a list of expressions
Title of invention: semantically related to an input linguistic
Titre de l'invention : expression

Klassifikation / Classification / Classement : G 06F 15/20

ENTSCHEIDUNG / DECISION

vom / of / du 16 March 1989

Anmelder / Applicant / Demandeur : International Business Machines Corporation

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Listing of semantically related linguistic
expressions/IBM

EPÜ / EPC / CBE Art. 52(1), (2), (3)

Schlagwort / Keyword / Mot clé : "Exclusion from patentability"

Leitsatz / Headnote / Sommaire

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Boards of Appeal

Chambres de recours

Case Number : T 52 /85



D E C I S I O N
of the Technical Board of Appeal
of 16 March 1989

Appellant : International Business Machines Corporation
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New York 10504
USA

Representative : Bonneau, Gérard
COMPAGNIE IBM FRANCE
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Decision under appeal : Decision of Examining Division 065 of the
European Patent Office dated 9 October 1984
refusing European patent application
No. 81 108 566.1 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : P.K.J. van den Berg

Members : W.B. Oettinger

E. Persson

Summary of Facts and Submissions

I. European patent application No. 81 108 566.1, filed on 20 October 1981 claiming a priority of 19 December 1980 and published under number 54 667, was refused by a decision of the Examining Division 22.01.065 dated 9 October 1984.

The reason given for the refusal was that the sole contribution to the art in the method claimed in Claim 1 filed on 19 September 1983, or in any of the dependent Claims 2 to 9, was a computer program as such within the meaning of Article 52(2)(c) and (3) EPC and no patentable invention within the meaning of Article 52(1) EPC could be identified in the application.

According to the precharacterising portion of the said Claim 1, the claimed invention related to a "method of generating a list of expressions semantically related to an input linguistic expression using a programmable data processing system" comprising a processor, memories, an input device and display means, and the claimed invention was characterised in that data stored in one of the memories were arranged in a particular manner and by a number of "steps" resulting in the list of expressions being displayed.

No examination with regard to the further requirements of the EPC was carried out in view of the fundamental lack of patentability within the meaning of Art. 52(2)(c) and (3) EPC.

II. On 11 December 1984, the Applicant lodged an appeal against the decision and paid the appeal fee.

A Statement of Grounds of Appeal was filed on 14 January 1985 contesting the Examining Division's finding.

In particular, the Appellant submitted that the claimed invention implied a new reconfigured hardware consisting of two functionally separate memories, requiring an adapted control (generally the micro-code of the operating system), and that the indexing technique applied would reduce the amount of storage and access time.

III. In a communication, dated 23 March 1987, the Rapporteur raised both formal and substantial objections against the method claims then on file.

It was the Board's provisional opinion that those claims depending on their interpretation, might be unallowable under Article 52(2) and (3) EPC.

The Appellant was invited to try to avoid this objection by filing (only) hardware claims if true hardware features could be proven to be originally disclosed. In this respect, it was considered that one of the memories, containing the "binary vocabulary matrix", might have an unusual structure and thus represent a true hardware feature, but that it was up to the Appellant to convince the Board that this was indeed the case.

IV. Together with a response the Appellant filed, on 6 November 1987, amended claims.

Independent Claims 1 and 11 read as follows:

"1. System for automatically generating a list of expressions semantically related to an input linguistic expression comprising an input device for inputting the linguistic expression, a first memory (15) storing a

vocabulary of linguistic expressions including a pre-sorted index of said vocabulary, each linguistic expression including address code keyed to said index, and a display device (3) for displaying linguistic expressions; said system being characterised in that it comprises:

a second memory (12) storing data linking the address codes of the linguistic expressions stored in said first memory, being arranged as a logical representation of the matrix type with N inputs where N is equal to the number of linguistic expressions of the vocabulary stored in said first memory,

comparison logic comparing the input linguistic expression to said pre-sorted index for finding the address location of said input linguistic expression in said first memory, and

storing the address code associated with the stored linguistic expression when an equal occurs,

access logic for accessing said second memory at the address specified by the stored address code,

decode logic for decoding the data stored at the accessed address into address codes for said first memory,

utilisation logic for utilising the corresponding address codes to access said linguistic expressions stored in said first memory, and

concatenation logic for concatenating the accessed linguistic expressions located at the address codes in said first memory into said display device.

11. Method for displaying a list expressions semantically related to an input linguistic expression which is entered by an operator into a processing system comprising an input device for inputting the linguistic expression, a first memory (15) storing a vocabulary of linguistic expressions including a pre-sorted index of said vocabulary, each linguistic expression including address code keyed to said index, and a display device (3) for displaying the expressions semantically related to said input linguistic expression; said method being characterised by the steps of :

storing in a second memory (12) data linking the address codes of the linguistic expressions stored in said first memory, said data being arranged as a logical representation of the matrix type of N inputs where N is equal to the number of linguistic expressions of the vocabulary stored in said first memory,

comparing the input linguistic expression to said pre-sorted index for finding the address location of said input linguistic expression in said first memory, and

storing the address code associated with the stored linguistic expression when an equal occurs,

accessing said second memory at the address specified by the stored address code,

decoding the data stored at the accessed address into address codes for said first memory,

utilising the corresponding address codes to access said linguistic expressions stored in said first memory, and

concatenating the accessed linguistic expressions located at the address codes in said first memory for displaying onto said display device."

Claims 2 to 10 are depending on Claim 1 and Claims 12 to 20 are depending on Claim 11.

Claims 2 and 12 specify the second memory as being of the type $N \times N$ matrix, the row and column designations corresponding to the linguistic expressions of the vocabulary stored in said first memory, said matrix containing for each row addressed by the address code of the associated linguistic expression "one" bits in all columns associated with linguistic expressions semantically related to said linguistic expression of the addressed row.

Claims 3 to 5 and 13 to 15 relate to a run-length logic used with the second memory.

Claims 6 and 16 specify the comparing function of the comparison logic, or the comparing step, respectively, further.

Claims 7/17 and 9/19 relate to synonyms and antonyms, respectively, as semantically related expressions, and Claims 8/18 and 10/20 specify their display.

- V. The Appellant submits mainly that the claimed invention provides a technical solution to a technical problem, in that the subject-matter of the system claims, which can be implemented in combinational logic forming a special purpose computer or with a processing system under the control of a micro-code, implies a reconfigured hardware.

Whether the described embodiment is implemented in software or conventional hardware is not relevant in the Appellant's view, and it would be inappropriate to make a distinction between these implementations.

- VI. It follows from the notice of appeal and the Statement of Grounds that the Appellant requests to set aside the appealed decision and grant a patent based on the Claims 1 to 20 filed on 6 November 1987 and on the description and drawings as published.

Reasons for the Decision

1. The appeal is admissible.
2. No objection under Article 123(2) EPC arises.

The mere fact that a new claim category has been introduced, does not give rise to an objection under this Article since the originally claimed method already implied the system as claimed now for carrying out that method.

3. The Board has come to the conclusion that the subject-matter claimed does not concern an invention within the meaning of Article 52(1) EPC.

The considerations on which this conclusion is based will be set forth below.

4. The subject-matter of all present claims is in the field of linguistics such as text processing and that activity is carried out by a processing system including a processor. The preferred embodiment described is a program controlled conventional general purpose computer, the

program instructions causing the processor to carry out the processing.

The issue to be decided in the present case is whether this subject-matter is excluded from patentability under Article 52(2) and (3) EPC.

5. According to the opening passage of Claim 1, protection is sought for a system (intended and suitable) for automatically generating a list of expressions semantically related to an input linguistic expression.

5.1 Such a semantical relationship is basically not of a technical nature but a matter of the meaning of those expressions, i.e. of their abstract linguistic information content; it does not relate to any physical entity. A semantical relationship can be found by performing mental acts only, with no technical means involved.

This does not necessarily mean that any system automatically concatenating, in place of a human being, semantically related expressions to a list is excluded from patentability. Rather, this will depend on whether the manner in which it is automated, involves features which make a contribution in a field outside the range of matters excluded from patentability under Article 52(2) and (3) EPC.

5.2 According to the "means" part of the precharacterising portion of Claim 1, the system comprises: an input device, a (first) memory, and a display device.

The input device is intended for inputting the linguistic expression. The (first) memory stores a vocabulary of linguistic expressions (including a pre-sorted index of said vocabulary, each linguistic expression including

address code keyed to said index). The display device is intended for displaying linguistic expressions (this is understood as meaning the list of semantically related expressions).

An input device, a memory and a display device, all being conventional parts of a computer, and the function of these elements always being that of inputting, storing and displaying data, the contribution made by their aforementioned functions relates only to the kind of data so treated. Those data are, however, featured only by their linguistic properties, namely their semantical relationship. So, these features do not make a contribution in a field outside the linguistic significance of the data stored.

- 5.3 According to the characterising portion of Claim 1, the system comprises a second memory and (not expressly mentioned) further storing means, and a number of logics.

Memories and other storing means as well as logics are conventional means in any computer, and storing, comparing etc. are all conventional functions of memories or logics, respectively. So it is left to examine what contribution is made by the particulars in the individual functions defined in the characterising features:

- A second memory stores data linking the address codes of the linguistic expressions stored in said first memory, being arranged as a logical representation of the matrix type with N inputs where N is equal to the number of linguistic expressions of the vocabulary stored in said first memory.
- Comparison logic compares the input linguistic expression to said pre-sorted index for finding the

address location of said input linguistic expression in said first memory.

- Storing means (not expressly mentioned) stores the address code associated with the stored linguistic expression when an equal occurs.
- Access logic is intended for accessing said second memory at the address specified for the stored address code.
- Decode logic is intended for decoding the data stored at the accessed address into address codes for said first memory.
- Utilisation logic is intended for utilising the corresponding address codes to access said linguistic expressions stored in said first memory.
- Concatenation logic is intended for concatenating the accessed linguistic expressions located at the address codes in said first memory into said display device.

In effect, these features show the following sequence of functions: for an input linguistic expression, its memory address is looked up; then the second memory is accessed with it; with the read out data the first memory is accessed; all the linguistic expressions so gathered are displayed.

These functions as such are all conventional: storing data; comparing input data with an index for finding an address location; storing the address; accessing with it a memory; decoding the addressed data; utilising the decoded data as an address for accessing another memory; displaying the addressed data. All that goes beyond these

functions relates merely to the linguistic meaning of the words stored, compared, etc. in coded form, namely to their property of either being, or not being, semantically related to other stored words, the second memory having been "pre-programmed" with the semantical relationship to be applied.

It follows that the functional features of the individual system elements relate to the linguistic evaluation, on the basis of a linguistic relationship, of input linguistic data, for the purpose of displaying a linguistic result, the actual processing involving only conventional techniques of storing, accessing etc. coded data.

No contribution is therefore made in a field outside linguistics nor outside the field of conventional computer performance.

- 5.4 Moreover, the functioning of the computer is, in the only embodiment which has been described (page 3, lines 23 to 28) and which is preferred (page 7, lines 26 to 29), under control of an appropriate program.

No contribution is consequently made in a field outside computer programming either.

- 5.5 The present case is, for the above reasons, to be distinguished from cases where a program controlled computer is used for processing data or signals which represent physical entities in a technical process. In such cases a contribution is made in a field outside the range of matters excluded from patentability, in particular outside computer programming. For instance, in one case already decided (T 208/84, OJ EPO 1987, 14), this contribution consisted in enhancing or restoring the

technical quality of digitally processed images; in another (T 26/86, OJ EPO 1988, 19), it consisted in controlling an X-ray tube so as to ensure optimum exposure with efficient protection against overloading of the tube.

In contrast to such cases, the claimed system displaying semantically related linguistic expressions has no comparable technical effect and makes no contribution, based on such a technical effect, to the art.

- 5.6 No different conclusion can be drawn from the fact, expressed in the description (page 7, lines 29 to 31), that the claimed invention can be implemented as combinational logic forming a special purpose processor or as micro-code rather than as a programmable general purpose computer which is the preferred implementation.

In the absence of any indication to the contrary, such an implementation as micro-code, which is understood as meaning an implementation by the "operating system" or "system software" rather than by a user program, or even as a special purpose processor would only reside in the straightforward realisation of an algorithm expressing the linguistic relationship to be applied to the linguistic data in the same way as it is realised by a user program for a general purpose computer.

Nothing in the disclosure would point to a contribution made by this implementation which goes beyond the fields of linguistics and computer functioning directly derived, like a program, from the linguistic relationship to be applied.

- 5.7 The argument in the Statement of Grounds of Appeal, that this invention comprises two functionally separate

memories which are controlled by the micro-code of the operating system is not considered, in the circumstances, as proving that new reconfigured hardware is involved.

The distinction suggested by the Appellant between "logical" configuration of the memory by an application program input by the user, and a "controlled" configuration by the micro-code of the operating system, appears artificial as far as the exclusion of software from patentability is concerned. In both cases, a single physical memory can be used which would be reconfigured only functionally either by user software or by system software.

- 5.8 The Appellant has further maintained that the invention as now claimed is a technical solution of a technical problem.

As regards the problem, the finding of semantically related linguistic expressions has to do with the linguistic significance of words and is thus a linguistic problem. No technical problem of the computer is to be solved.

As regards the solution, technically the computer does not seem to work in an unusual way. Functionally it works in the following way: an input expression is examined as to whether there are other expressions with which it is semantically related, the semantical relationship having been pre-stored in a memory. This is, in effect, nothing else but what a human being searching for semantically related words would do, namely check his memory for any such words. The solution claimed is thus the straightforward automation of said linguistic problem.

It remains, of course, true that internally a computer functions technically and this applies also to its display device. However, the effect of this function, namely the resulting information about the existence of semantically related expressions, is a purely linguistic, i.e. non-technical result.

The Appellant agrees that the claimed system can be implemented by pure software and this implementation is the only one described and preferred. No new reconfigured hardware has been shown to be used in this case. As said before, the two memories can be different sections of a single (conventional) memory. In the opinion of the Board, this new reconfiguration by software is not a technical contribution here.

No other conclusion can therefore be drawn than that the subject-matter of Claim 1 does not contribute anything to a field not excluded from patentability by the provisions of Article 52(2) and (3) EPC.

System Claim 1 can therefore not be allowed.

6. The same applies to the dependent Claims 2 to 10.

For instance, Claim 2 only more clearly defines the quadratic matrix of the second memory which can be configured by software. It has not been shown that, in the case of a pure software implementation, new reconfigured hardware is involved by this software controlled memory partitioning and configuration. The operation of the processor is not being changed by the said software.

7. Method Claim 11 repeats all the functions of the system elements defined in Claim 1 and adds nothing in substance to them.

For this reason, its subject-matter contributes no more to the art than the subject-matter of Claim 1.

Method Claim 11, and its dependent Claims 12 to 20, can therefore not be allowed either.

8. The reasoning given here, is in line with an earlier decision T 38/86 dated 14 February 1989 (to be published).

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

F.J.M. Klein

P.K.J. van den Berg