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File Number: T 236/91 - 3.5.1
Application No.: 84 300 515.8
Publication No.: 0 118 187
Title of invention: Menu-based natural language understanding system
Classification: G06F 3/037

D E C I S I O N
of 16 April 1993

Applicant: TEXAS INSTRUMENTS INCORPORATED

Headword:

EPC Articles 52(2)(c), (d), (3), 56

Keyword: "Presentations of information as such (no) - technical contribution to the art" - "mental acts as such (no)" - "computer program as such (no)" - "inventive step (yes) - new features - combination not rendered obvious by prior art"

Headnote



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Boards of Appeal

Chambres de recours

Case Number : T 236/91 - 3.5.1

**D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 16 April 1993**

Appellant : TEXAS INSTRUMENTS INCORPORATED
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Decision under appeal : Decision of Examining Division 2.2.01.065 of the
European Patent Office dated 15.10.90 refusing
European patent application No. 84 300 515.8
pursuant to Article 97(1) EPC.

Composition of the Board :

Chairman : P.K.J. van den Berg
Members : W.B. Oettinger
F. Benussi

Summary of Facts and Submissions

- I. The appeal contests the Decision, dated 15 October 1990, of the Examining Division to refuse the European patent application No. 84 300 515.8 filed on 27 January 1984, claiming a priority of 28 January 1983.

The reason given in that Decision was that the subject-matter of Claim 1 filed on 27 April 1990 did not involve an inventive step, that claim reading as follows:

"A computer having a menu-based input system to enable an operator to make a multi-word input by selecting and then entering words or phrases from each of a plurality of sequentially presented menus, the menus presented after the first menu being determined by the selected entry or entries made from at least one previous menu,

characterised in that

the computer includes

means for storing a lexicon containing words and/or phrases acceptable to the computer together with the different linguistic categories (for example, noun, phrase, intransitive verb, adjective, adverb, determinant, etc.) to which the words and/or phrases belong,

means for storing representations of the rules of grammar of a sub-set of a natural language, the grammar rules defining the proper formation of structures in the natural language composed of the different linguistic categories, and

parsing means responsive to the linguistic category or categories of the or each word or phrase previously selected from a menu and entered and, when more than one such word or

phrase has been entered, to the order in which the previously selected words and/or phrases have been entered, to parse using the grammar rules the partial sentence formed by the word or words and/or phrase or phrases selected and entered up to that time, the parsing being performed each time a word or phrase is added to the partial sentence and in all ways that are valid within the grammar rules, the parsing means being arranged to derive from the parsing of a partial sentence the linguistic categories of all words or phrases that could follow the partial sentence within the grammar rules, and to select from the stored lexicon words and/or phrases belonging to the or each linguistic category derived by the parsing means to form the next menu for presentation to the operator,

whereby the multi-word input made by the operator is constrained to form a sentence satisfying the grammar rules of the natural language,

means for enabling the operator to enter an indication that the words and/or phrases that have been entered form a complete sentence,

and means for translating a parsed complete sentence into a command executable by the computer."

More particularly, the Examining Division held that the claimed computer would be obvious to the skilled person, having regard to the following prior art documents:

D1: 1982 International Zurich Seminar on Digital Communications, Man-Machine Interaction, 9 to 11 March 1982, Proceedings, IEEE Catalog No. 82CH1735-0, pages 153-158 (E6.1-E6.6);

D2: Computer, volume 13 (1980) No. 7 (July) pages 35-48.

In support of this conclusion, the Examining Division advanced essentially the following arguments:

- The database system of D1 employs menu techniques, such techniques being described in D2, and the items used in menus are normally in a natural language as claimed in the present case.
- No difference can be seen between the claimed parsing (as defined in the description) and item recognising as involved in conventional menu selection.
- The sub-division, as claimed, of the lexicon required for this purpose, into linguistic categories is most obvious.
- The Applicant's counter-arguments based on certain advantages of the claimed computer are unconvincing.
- If the sequence of items, resulting from the operation of the claimed computer differs from that resulting from the operation of the system of D1 in that it is a grammatically correct sentence in a natural language, this would merely be a question of presentation of information and thus excluded from patentability (Article 52(2)(d) EPC).

II. According to the file, the Decision was preceded by oral proceedings in which the Examining Division considered that a Claim 1 as filed on that day (7 February 1990) would be acceptable.

But the Applicant subsequently disapproved of a claim so worded.

III. The notice of appeal was lodged on 20 November 1990 with a request that the appealed Decision be reversed and a patent be granted on the basis of Claim 1 filed with the appeal. The latter was identical to Claim 1 as refused by the Examining Division.

On 26 November 1990, the Appellant paid the respective fee.

By telecopy of 21 February 1991, the Appellant filed a Statement of Grounds.

IV. Together with the Statement of Grounds, the Appellant refiled once more Claim 1 as refused by the Examining Division and filed dependent claims as well. Furthermore, he filed two alternative versions for the independent Claim 1 constituting his auxiliary requests. On 1 March 1991, he refiled that Statement of Grounds and the annexes to it.

Using these last filed documents, the Board understands the Appellant's main request as comprising the following application documents:

- Claim 1 filed on 1 March 1991
Claims 2-6 filed on 1 March 1991;
- Description pages 1-52 filed on 28 June 1990;
- Drawings, Sheet/Figure 1-16, as published.

V. In essence, the arguments advanced by the Appellant in support of his main request can be summarised as follows:

- Inventive steps can be seen in the novel features distinguishing the claimed computer from the cited prior art: in the predictive parser, in the lexicon storing words or phrases together with their linguistic

categories, in the storing of grammar rules, and in the generation of a menu according to the syntax of the partial sentence thus far composed, these inputs being unstructured.

- Additionally, the combination of natural language with a menu system, or even the combination of all the aforementioned aspects are also inventive steps.
- The Examining Division's arguments show fundamental misunderstandings of both the claimed invention and the references and are factually incorrect in several respects.

VI. On 18 May 1992, the Appellant filed an auxiliary request for oral proceedings, and on 23 November 1992 he responded to a communication from the Board in which the Board had expressed doubts about the claimed computer not being excluded from patentability under Article 52(2) and (3) EPC.

In essence, he submitted that the claimed system would solve at least the technical problem of enabling an operator to communicate effectively with a computer in his natural language, and bring about at least two technical effects, namely, considerably reducing the amount of storage required and providing a remarkable degree of flexibility for input in a natural language.

In his response he discussed the earlier Decisions T 38/86 (OJ EPO 1989, 384) and T 121/85 cited by the Board, and relied instead on T 115/85 (OJ EPO 1990, 30) and T 163/85 (OJ EPO 1990, 379) as supporting his case.

Reasons for the Decision

1. The appeal (cf. III) is admissible.
2. In view of the outcome of the appeal in respect of the Appellant's main request (cf. paragraph 7), no further reference is made to his auxiliary requests (cf. point IV).

3. Amendments

Claim 1 of 1 March 1991 (main request) is identical to Claim 1 filed on 27 April 1990 as refused by the Examining Division.

Even though Claim 1 of 1 March 1991 differs vastly in wording from any of the originally filed independent Claims 1, 2 and 3, it can apparently be regarded as being based, in essence, on either Claim 1 or Claim 2 as originally filed, with the particulars and functions of the claimed means being derivable from the original description.

The Board, therefore, is satisfied that Claim 1 of 1 March 1991 (main request) complies with Article 123(2) EPC.

4. Patentability

Article 52(1) EPC states that European patents should be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step.

- 4.1 According to the appealed decision, the ground for refusal was that the claimed subject-matter did not involve an inventive step within the meaning of Article 56 EPC, the

Examining Division apparently having tacitly recognised that the said subject-matter is novel and susceptible of industrial application.

However, the patentability of inventions is further limited to inventions which do not fall under the exclusions mentioned in Article 52(2), as far as Article 52(3) applies. The feature common to most of the matters excluded by the non-exhaustive list of Article 52(2) is generally qualified as "non-technical".

4.2 Of those non-technical matters mentioned in said list, two would seem to be involved in the present case:

- presentations of information (Article 52(2)(d)), and
- schemes, rules or methods for performing mental acts (Article 52(2)(c)).

Furthermore, the exclusion of programs for computers (still Article 52(2)(c) EPC) would have to be considered. This exclusion does not necessarily concern non-technical subject-matter.

Mental acts would - as a matter of logic - seem to be involved in the feature "selecting words or phrases from each of a plurality of sequentially presented menus" (cf. precharacterising portion of Claim 1).

Computer programs would seem to be involved in the features "storing a lexicon ..." and "storing ... rules of grammar" in that the very storing operations will - as a matter of course - be executed under the control of computer programs (for instance, subroutines).

Presentation of information would seem to be involved in the features "menus presented" (cf. precharacterising portion)

and "to form the next menu for presentation ..." (cf. the last part of the features defining the "parsing means").

The fact that presentation of information is involved has been indicated in the decision under appeal, when rebutting an argument advanced by the Appellant in favour of an inventive step, but that decision is silent about the possible involvement of the other two excluded matters.

4.3 In any case it is rather obvious that the computer according to Claim 1 of 1 March 1993 (main request), i.e. the subject-matter of this claim considered in its entirety cannot be regarded as relating

- only to presentation of information as such, and/or
- only to performing mental acts as such, and/or
- only to a program for computers as such.

In deciding the present case it will therefore be necessary to deal with these excluded matters only insofar as there is an "interrelationship" between any of them and the main issue to be decided, namely the involvement of an inventive step (paragraph 6 below).

5. The inventive step issue considered individually

5.1 According to the file, the Applicant, when having formulated the precharacterising portion of present Claim 1 for the first time (12 January 1989), stated that this portion is based on D2 rather than on D1.

Even though the Board sees no important reason to raise the question whether indeed D2 is the prior art document coming "nearest" to the claimed invention it wishes, for the purposes of the issue to be decided, to start out from D1 rather than D2.

5.2 D1 discloses a database information retrieval system requiring and enabling the user to make a multi-word input for the search of either structured data or unstructured data (Section 2.3).

In the case of structured data, it proposes three alternative techniques: using command language, a menu technique, or search masks (Section 2.3.1).

In the case of unstructured data, it proposes to run the search in (a sub-set of) natural language (Section 2.3.2).

The Board notes that the term "natural language" is, in the present context, to be understood as meaning language as it is spoken or written by human beings in normal, everyday, environments (e.g. English) and not, for instance, as used by a programmer when writing a computer program.

In D1 the first mentioned three and the fourth types of dialogue are separately specified as alternatively applicable (Section 4.1). Thus, for instance, the menu technique is said to be employed in order to reduce the disadvantages of command language dialogue and natural language dialogue.

According to D1, all four dialogue types can be represented in the same data retrieval system (Section 4.2), but this is understood as meaning that they are represented therein as separate options. That statement is not understood as proposing to use "natural language" in the "menu techniques".

The Examining Division has nevertheless argued that the items used in menus are normally in natural language. This is clearly true and the Board cannot agree with the

Appellant's submission that these items are only "single letters". According to D2, for instance, a menu can contain English words like "help", "back", "next", etc..

However, the claimed invention requires not only that individual words entered by a menu technique are items of a natural language but also that the whole sentence or phrase so far having been input obeys the rules of grammar of that language. This is clearly not the case with the system of D1. Where it proposes to use the menu technique (Section 2.3.1 and in one of the paragraphs of Section 4.1), it does not suggest that this technique is used for constructing a whole sentence, grammatically correct, in a natural language.

It may be true that if aspect and search key are combined and/or several queries are linked by logical operators and/or a range of values is searched by means of comparison operators (Section 2.3.1), the result may, to some extent, resemble a sentence in natural language (as exemplified in the Decision under appeal, paragraph 4) but this resemblance is then to be regarded as accidental in the sense of a special case because, actually, the resulting command is still, by its nature, in a kind of computer language (only used by programmers when programming) and not in a "natural" language (as hereinbefore defined).

- 5.3 Claim 1 requires that the computer has, apart from means for storing a lexicon together with the linguistic category of each word or phrase (first characterising feature), also means for storing representations of the rules of grammar of a sub-set of the natural language employed (second characterising feature).

It further requires that, after each word or phrase has been entered, the lexicon is accessed for determining the

linguistic category of that word or phrase and, in dependence upon the result, the rules of grammar are accessed for determining which words or phrases if appended to the words or phrases already entered would obey these rules (third characterising feature).

Nothing of this kind can be derived from D1.

It is in this sense that menus of the claimed computer can be regarded as constructed ad hoc rather than as pre-defined whereas those of D1 are clearly pre-defined.

Furthermore, the claimed word-by-word parsing of partial sentences is quite different from analysing a whole sentence in one step as is done in the prior art; and the claimed menu-based inputting of a sentence in natural language is therefore not equivalent to the prior art direct inputting of a sentence in natural language.

- 5.4 The mere fact that D1 mentions menu techniques as well as natural language inputting does not, in the absence of any further hint, give an incentive to the skilled person to combine both or, at least, it does not give any hint on how to combine them.
- 5.5 No such incentive or hint can furthermore be derived from D2. That document is concerned with an electronic dictionary but not with the entering of whole sentences, grammatically correct, in a natural language.
- 5.6 The other documents mentioned in the search report had not been cited by the Examining Division and the Board sees no reason for considering these to be more relevant to the claimed menu-based natural language input system computer than D1 and D2.

- 5.7 In the opinion of the Board, therefore, the differences from the background art as defined in Claim 1 and considered above (paragraphs 5.2 and 5.3) are not rendered obvious by the prior art as a whole.

Consequently, the claimed invention, i.e. the computer defined in Claim 1 is not obvious and any further restriction of this claim for rendering the claimed invention unobvious, as suggested by the Examining Division (cf. paragraph II), appears not to be necessary.

6. The inventive step issue considered as part of the patentability issue

- 6.1 Article 52(1) EPC stipulates, inter alia, that, for being patentable, the claimed subject-matter must be an "invention which involves an inventive step" (emphasis added). This formulation is understood as embracing, apart from the separate requirements "invention" and "inventive step" as individual items, an "interrelationship" between these two, or an additional requirement, of the kind that as an invention not excluded from patentability by Article 52(2) and (3) EPC the claimed subject-matter must involve an inventive step; or, in other words, that the inventive step must concern non-excluded, or technical, matter.

This interpretation is perfectly in line with the Boards' case law. It is generally recognised that a patentable invention may consist of a mix of non-technical and technical elements of which the non-technical ones as such would be excluded and the technical ones would not be excluded per se from patenting. In such a case, the claimed invention may nevertheless be patentable conditional upon that it makes a contribution to the art and that this contribution is technical. It is not, in principle, necessary that this contribution is a new technical feature;

instead it may lie in a technical problem which is solved or in the technical effects achieved.

For instance, in T 38/86 (OJ 1990, 384), referring also to T 208/84 (OJ 1987, 14) and T 26/86 (OJ 1988, 19), the Board has decided that "while the EPC does not prohibit the patenting of inventions consisting of a mix of excluded and non-excluded features" (paragraph 12 of the Reasons for the Decision) and "(since) patentability is excluded only to the extent to which the patent application relates to excluded subject-matter or activities as such" (paragraph 12 and Headnote II), "it appears to be the intention of the EPC to permit patenting (only) in those cases in which the invention involves a (some) contribution to the art in a field not excluded from patentability" (paragraph 12 and Headnote II).

In effect, on the basis of the same considerations, similar conclusions were drawn in a number of other cases, for instance in T 22/85 (OJ 1990, 12).

The above-mentioned "interrelationship" between the requirement that a claimed invention must not be excluded from patentability and the requirement that as such a non-excluded invention it must involve an inventive step can be derived, for instance, from T 65/86 (paragraph 18 of the Reasons).

- 6.2 When applied to the present case, these general considerations on the issue of patentability including said "interrelationship" as developed in earlier decisions would mean that even after the claimed computer has been found unobvious (paragraph 5.7), it is still to be decided whether or not a technical contribution to the art is made by the non-obvious feature or features of that computer.

This is, in the opinion of the Board, indeed the case for the following reasons:

- 6.3 Disregarding all the excluded matters (cf. paragraph 4.2) and all those means and functions which are clearly conventional (e.g. inputting, storing and presenting means) from Claim 1, it would seem that a technical effect of the subject-matter of Claim 1 as a whole would be caused at least by the feature concerning the "parsing means", even if parsing as such may be considered to be of a non-technical nature.

The gist of the claimed invention can be seen in the fact that a sentence in natural language is parsed not only after it has been entered completely into the computer, in one go but, on the contrary, step by step after each word or phrase (consisting of only a few words) has been entered, and that in dependence upon the result of this parsing, a new menu presenting only a selection, to wit a selection which cannot be pre-defined by the designer of the computer, of possible continuations of the sentence is created (cf. also paragraph 5.3).

This ad hoc creation of menus, not pre-defined, by a "partial parser" has not been found in the prior art in a similar environment and it is to be regarded as one of those features which render the claimed computer unobvious.

In this sense, the internal working of the computer as claimed is not "conventional" and should, in the opinion of the Board, be regarded as a technical effect.

- 6.4 Moreover, the ultimate purpose of the claimed computer inputting system is the inputting of a command executable by the computer and, as stated in Claim 1, it therefore

includes means for translating the parsed complete sentence into such a command.

The inputting of a command is not normally to be equated with the inputting of sentences for purely linguistic, or editing, purposes in text processors, such linguistic, or editing, activities being of a fundamentally intellectual nature. Rather, the goal of the inputting of a command is the execution of this command by a particular function of the computer, and this execution will normally have a technical effect.

In the preferred embodiment, the command is used, for instance, as a query for retrieving data stored in a database system; but, as another, equally envisageable, example, it could trigger a control function in a technical process.

Therefore, in the opinion of the Board, in the claimed computer, the effect of the inputting of a parsed complete sentence as a command, i.e. the execution of this command by the computer, cannot be regarded as being generally, or fundamentally, non-technical (as would be the inputting of text for editing purposes).

Even though the inputting of a command, e.g. query, for its execution by the computer is not, in itself, novel but known from D1, the particular kind in which it is inputted in the claimed computer is novel and even unobvious (cf. paragraph 5.7). Furthermore, it would appear that this different kind of inputting a command would have an influence on the range of possible applications of the claimed computer, or its suitability for different tasks, including technical processes.

- 6.5 The Board is, for these reasons, of the view that a technical contribution is indeed made to the art by the unobvious features of the claimed computer and that, therefore, the present case allows a conclusion different from that drawn in the earlier cases (mentioned above) relating to text processing and in which the only contribution made seemed to lie in fields excluded from patentability, such as linguistics and computer programs.

Since, in the present case, also the other requirements mentioned in Article 52(1) EPC are met, the subject-matter claimed is to be regarded as patentable.

7. Claim 1 (main request) is therefore considered allowable and the Appellant's request, that the Decision under appeal be set aside, is, for this reason, to be allowed.

This decision not being adverse to the Appellant, his auxiliary request for oral proceedings is not relevant.

8. The dependent claims on file differ vastly not only in wording, but also, at least partly, even in substance, from the dependent Claims 4 to 7 filed originally and from any claims filed afterwards and considered by the Examining Division.

In these circumstances, the Examining Division has not had an opportunity to carry out the necessary examination of these claims in any respect. Even though an Article 56 objection would no longer be possible, given the allowability of Claim 1, there are other provisions which have to be observed.

Similar considerations apply in respect of the amended description.

In the present case, with the intensive amendments made, this examination is best, and should be, carried out by the first instance department in order not to deprive the Appellant of a two-instance procedure.

Therefore, the Board finds it appropriate, in the exercise of its discretion under Article 111(1) EPC, to remit the case to the Examining Division for the further prosecution as far as the application documents other than Claim 1 are concerned.

Order

For these reasons, it is decided that:

1. The Decision under appeal is set aside.
2. The case is remitted to the Examining Division for further prosecution on the basis of the application documents mentioned in paragraph IV with the proviso that Claim 1 according to the main request is patentable.

The Registrar:

The Chairman:

M. Kiehl

P.K.J. van den Berg