Datasheet for the decision
of 17 March 2017

Case Number: T 2104/11 - 3.5.07
Application Number: 09151028.9
Publication Number: 2184686
IPC: G06F17/27
Language of the proceedings: EN
Title of invention:
Method and system for generating derivative words
Applicant:
Guangdong Guobi Technology Co. Ltd.
Headword:
Generating derivative words/GUANGDONG GUOBI
Relevant legal provisions:
EPC Art. 56
Keyword:
Inventive step - (no)
Decisions cited:
Catchword:
Case Number: T 2104/11 - 3.5.07

DECISION
of Technical Board of Appeal 3.5.07
of 17 March 2017

Appellant: Guangdong Guobi Technology Co. Ltd. (Applicant)
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Decision under appeal: Decision of the Examining Division of the European Patent Office posted on 10 June 2011 refusing European patent application No. 09151028.9 pursuant to Article 97(2) EPC.

Composition of the Board:
Chairman R. Moufang
Members: M. Jaedicke
P. San-Bento Furtado
Summary of Facts and Submissions

I. The applicant (appellant) appealed against the decision of the Examining Division refusing European patent application No. 09151028.9 claiming a priority date of 7 November 2008.

II. The Examining Division decided that the subject-matter of the independent claims of the then pending sole request lacked novelty in view of the following document:


III. In the written proceedings the Examining Division cited the following further prior-art document:


IV. With the statement of grounds of appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of a newly submitted amended sole request. The appellant also submitted arguments in favour of novelty and inventive step.

V. In a communication under Article 15(1) RPBA accompanying a summons to oral proceedings, the Board inter alia expressed its provisional opinion that the subject-matter of claim 1 of the sole request lacked inventive step over document D2.
VI. With a letter dated 8 March 2017, the appellant informed the Board that it would not be attending the oral proceedings and requested a decision "according to the present state of the file". No arguments in reply to the Board's objection on the basis of document D2 were submitted.

VII. Oral proceedings were held as scheduled in the absence of the appellant. At the end of the oral proceedings, the chairman pronounced the Board's decision.

VIII. Claim 1 of the appellant's sole request reads as follows:

"A method for generating derivative words, the method comprising the steps of:

1) creating a plurality of arrays of derivative grammar rule [sic] each comprising a suffix letter character sequence and a condition array having a part of speech corresponding to that of the base words as required by corresponding suffix letter character sequence;

2) inputting a user character sequence;

3) matching the user character sequence with each array of derivative grammar rules and obtaining the arrays of derivative grammar rules which match with the user character sequence;

4) obtaining words meeting the requirement of the condition arrays of the obtained arrays of derivative grammar rules from a language database in accordance with the user character sequence, and generating derivative words via adding the suffix letter character sequences to the obtained words, the suffix letter character sequences being comprised in the arrays of derivative grammar rules which comprise the condition arrays as met by the obtained words; and
5) outputting the generated derivative words."

**Reasons for the Decision**

1. The appeal complies with the provisions referred to in Rule 101 EPC and is therefore admissible.

**The invention**

2. The application relates to a method and system for generating derivative words. Using a set of derivative grammar rules for generating suffixes for words of an inflected natural language, and a language database containing words of this natural language, the method matches a character sequence input by a user (for example using a reduced keyboard as known from mobile phones or a handwriting input device) with the suffix character sequences of the grammar rules. Next it obtains words meeting the conditions of the matched grammar rules and the input character sequence from the language database. It applies the grammar rules to the obtained words to generate derivative words, which are output.

For example, when the user inputs the character sequence "workin", the invention might output the word "working" as a derivative word using a grammar rule with the suffix character sequence "ing", which partly matches the last two characters "in" of the input character sequence "workin" (see paragraph [0087] of the description).

The purpose of the invention is to provide a method and system which is able to reduce the storage space of a language database for inflected languages. This is
solved by using grammar rules (also known as morphological rules) to generate derivative words, thus eliminating the need to store these derivative words in the language database. A possible application of the method is in word-prediction systems which allow users to input natural language with less effort (for example fewer keystrokes, in particular when using reduced keyboards with keys that are ambiguous, i.e. correspond to several different characters).

Inventive step - Articles 52(1) and 56 EPC

3. According to the contested decision, the then pending claim 1 lacked novelty over document D1. This claim differs from claim 1 of the appellant's current sole request in that it included features relating to the use of key character sequences from a reduced keyboard, and in that it did not contain the step of outputting the generated derivative words.

While document D1 concerns a system for word prediction in the context of a reduced keyboard, it discloses merely grammar rules for generating compound nouns and does not specifically address the problem of suffix generation in general.

As the pending method claim 1 no longer relates to the use of a reduced keyboard, document D2 is more relevant: it addresses inter alia the problem of generating word completions based on grammar rules for identifying a correct suffix in a method of word prediction.

4. Document D2 presents FastType, a system for word and letter prediction for Italian, which is an inflected language in which the correct word form depends on the
context. FastType suggests correct and well-formed words to users. It helps to minimise the number of keystrokes and is said to be particularly useful for users with motor impairments or speech or language disabilities such as dyslexia and for non-native users. For this purpose, document D2 describes a computer-implemented word prediction system.

Document D2 discloses in section 4 and Figure 1 the use of linguistic resources (see D2, page 81, right-hand column, last paragraph), comprising a dictionary (corresponding to the "language database" in claim 1) and "grammar", for providing morphological information including suffix letter character sequences. D2 explains this use of grammar rules based on parts of speech for example in page 83, left-hand column, first full paragraph:

"As discussed in the previous sections, Italian is a very inflected language, with many variations and morphological forms that make it difficult to predict appropriate words. The main idea is to parse the sentence and, applying a context-aware sieve, to provide only inflected completions in accordance with the context for \( p_n \). Specifically, as shown in Figure 3, given a candidate Part-of-Speech \( \text{POS}_n \), \( p_n \) completions are extracted from the dictionary and filtered by the Morpho-syntactic Sieve. Words which do not agree with the candidate \( \text{POS}_n \) are discarded, the others are on-the-fly inflected and ranked into the list of Inflected Suggestions."

A skilled person reading document D2 understands that the morphological rules are conditionally applied based on the part of speech of the base word (for example,
nouns and verbs have different suffixes). Hence, D2 discloses step 1 of the method of claim 1.

Document D2 explicitly discloses inputting a character sequence as specified in step 2 of claim 1 in section 6, second paragraph ("suppose the following sequence of words has been typed so far ...") and in section 6, last paragraph, first sentence.

Moreover, document D2 teaches extracting word completions from the dictionary and filtering the possible completions using part-of-speech analysis: words which do not agree with the candidate part-of-speech are discarded (see D2, section 6, paragraphs 2 and 3 and Figure 3). D2 also discloses generating via an inflection function, using grammar rules (called a "morpho-syntactic sieve" in D2), inflected suggestions/word completions in section 6 and Figure 3. Document D2 illustrates this method in the last paragraph of section 6: if the user wishes to type the Italian phrase "la ragazza scrive" (the girl writes), the system predicts after receiving the input "la" that the next word is a feminine singular noun. Hence, when the user then types the characters "rag", the system suggests inter alia the word "ragazza", which is the properly inflected form of the word baseform "ragazzo".

Document D2 also discloses that the on-the-fly inflected words are output as suggestions in a suggestion list and thus anticipates step 5 of the claimed method (see D2, Figure 3 and page 83, left-hand column, last paragraph: "ragazza" and "scrive" are exemplary inflected words output as suggestions in response to the user input character sequences "la rag" and "sc").
5. With the statement of grounds of appeal, the appellant submitted that D1 failed to "disclose, teach, or suggest" certain features of present claim 1. In addition, it submitted that D2 also failed "to disclose, teach, or suggest" these features. Hence, the subject-matter of claim 1 was not only novel, but also inventive. The appellant argued that the generation of derivative words (for example "patents", "patenting" and "patentable") was achieved by the method of claim 1 by combining an input character sequence such as "patent" and a suffix character sequence such as "s", "ing" or "able". Hence, the suffix character sequences did not need to be input by a user to generate and output the derivative words. Moreover, it was not necessary to pre-store the derivative words in a language database.

The system according to document D2 outputs derivative words with a suffix in response to an input character sequence (see D2, page 83, left-hand column, last paragraph: "[...] So, typing the user 'rag', 'ragazza' will be one of the suggestions, since it is the singular form [...]""). As this example shows, D2 already discloses that the user does not need to input the suffix character sequence. Moreover, D2 does not pre-store all derivative words in the dictionary, as it inflects the words extracted from the dictionary on-the-fly to generate the properly inflected word form. Hence, to reduce the size of the dictionary cannot be, as argued by the appellant, the effect when starting from D2 as closest prior art.

6. The difference between the teaching of D2 and the method of claim 1 lies in how the matching between the grammar rules and the input character sequence is done
(steps 3 and 4 of claim 1).

In D2 the suggestions are generated by first identifying possible completions using words from the dictionary, filtering the possible completions using part-of-speech analysis, and then inflecting the resulting completions.

In the claimed method the grammar rules are first used to identify possible matches by matching the input character sequence with the suffix of the rules to identify suitable rules, and then matching base words are retrieved from the dictionary.

7. From the wording of claim 1, the Board cannot see any technical effect to which this difference might contribute, and the appellant has not submitted any arguments in that respect.

The method of claim 1 achieves the generation of derivative words using grammar rules. The generation of such derivative words belongs however primarily to the field of linguistics. A user interface that minimises keystrokes by means of word prediction is already known from D2. The method of claim 1 does not propose any credible further improvement in this respect, as the claimed application of grammar rules means that the user input must already comprise part of the suffix (see the example of "workin" mentioned in the description and referred to in point 2 above; the appellant's example of "patent" as set out in point 5 above is therefore not convincing), whereas the method of D2 can already predict a word with a morphologically correct suffix before the user has started to input the suffix.
It follows that the difference over the closest prior art D2 results from a different linguistic approach to solving the problem of generating variants of words. This problem is in itself only of a non-technical nature (see Case Law of the Boards of Appeal of the EPO, 8th edition 2016, I.A.2.5.3 "Word-processing") and therefore not a matter for the technically skilled person.

Moreover, as the differing features do not specify in detail how the claimed functionality is actually implemented in a computing device the Board cannot identify any further technical considerations (for example, relating to the internal functioning of a computer). Hence, no technical problem is solved, apart from the mere automation of a per se linguistic algorithm for matching grammar rules in order to derive words.

8. At the priority date, the mere automation of a different kind of matching between the grammar rules and the input character sequence was a routine development that could be accomplished without any need for inventive skills by a software engineer starting from document D2.

9. Consequently, the method of claim 1 lacks inventive step over document D2 (Articles 52(1) and 56 EPC).

Conclusion

10. As the appellant's sole request cannot form the basis for the grant of a patent, the appeal has to be dismissed.
Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:                                     The Chairman:

I. Aperribay                                      R. Moufang

Decision electronically authenticated