

**Internal distribution code:**

- (A) [ - ] Publication in OJ
- (B) [ - ] To Chairmen and Members
- (C) [ - ] To Chairmen
- (D) [ X ] No distribution

**Datasheet for the decision  
of 18 May 2022**

**Case Number:** T 2752/19 - 3.5.05

**Application Number:** 09173500.1

**Publication Number:** 2161649

**IPC:** G06F3/023, G06F17/27,  
H04M1/2745

**Language of the proceedings:** EN

**Title of invention:**

Handheld electronic device with text disambiguation

**Applicant:**

BlackBerry Limited

**Headword:**

Text disambiguation for reduced keyboard/BLACKBERRY

**Relevant legal provisions:**

EPC Art. 56  
RPBA 2020 Art. 12(3), 13(2)

**Keyword:**

Inventive step - (no)  
Statement of grounds of appeal - party's complete appeal case  
Amendment after notification of a summons to oral proceedings  
- exceptional circumstances (no)

**Decisions cited:**

T 1904/16, T 0319/18



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 2752/19 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 18 May 2022**

**Appellant:** BlackBerry Limited  
(Applicant) 2200 University Avenue  
East Waterloo  
Ontario N2K 0A7 (CA)

**Representative:** Murgitroyd & Company  
Murgitroyd House  
165-169 Scotland Street  
Glasgow G5 8PL (GB)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 30 April 2019  
refusing European patent application No.  
09173500.1 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** P. Cretaine  
E. Mille

## **Summary of Facts and Submissions**

I. This appeal is against the examining division's decision posted on 30 April 2019, refusing European patent application No. 09 173 500.1. The application was refused for lack of inventive step (Article 56 EPC) of a main request and a first and a second auxiliary request in view of the disclosure of:

D2: US 5 953 541.

The following documents were also cited in the decision:

D1: US 6 204 848

D3: US 5 952 942.

II. Notice of appeal was received on 26 June 2019, and the appeal fee was paid the same day. The statement setting out the grounds of appeal was received on 2 September 2019. The appellant requested that the decision be set aside and that a patent be granted on the basis of the main request, the first auxiliary request or the second auxiliary request on which the decision was based and which were re-filed with the statement setting out the grounds of appeal. Oral proceedings were requested in the event that none of the requests was allowed.

III. A summons to oral proceedings was issued on 8 July 2021. In a communication pursuant to Article 15(1) RPBA, sent on 7 April 2022, the board gave its preliminary opinion, which was that the main request and the first and second auxiliary requests did not

meet the requirements of Article 56 EPC in the light of the disclosure of D2 and taking into account the common general knowledge as illustrated by D1 or D3. The appellant did not provide any substantiated response to the board's preliminary opinion.

IV. Oral proceedings were held on 18 May 2022. The appellant submitted a document showing an illustrative example in respect of the second auxiliary request. The appellant withdrew the main request and the first auxiliary request and requested that the decision under appeal be set aside and that a patent be granted on the basis of the set of claims of the second auxiliary request re-filed with the statement setting out the grounds of appeal. The board's decision was announced at the end of the oral proceedings.

V. Claim 1 of the second auxiliary request (sole request) reads as follows:

*"A method of disambiguating a character input into a handheld electronic device (4), the handheld electronic device including an input apparatus (8) for inputting characters into the device, an output apparatus for outputting characters, and a memory (20) having a plurality of objects stored therein, the plurality of objects including a plurality of language objects and a plurality of frequency objects (104) for indicating the relative frequency of occurrence of the language objects, each of at least a portion of the language objects (100) being associated with an associated frequency object, the plurality of language objects including a plurality of word objects (108) comprising complete words and a plurality of n-gram objects (112), substantially each n-gram object of the plurality of n-gram objects including at least a first character,*

*the input apparatus including a plurality of input members (28,34), each of at least a portion of the input members of the plurality of input members having a plurality of characters (48) assigned thereto, the method comprising:*

*detecting an ambiguous input (204) including a number of input member actuations of a number of the input members, each of at least a portion of the input members including a number of characters assigned thereto, at least one of the input members having a plurality of characters assigned thereto;*

*generating a number of prefix objects comprising various permutations of the characters corresponding with the ambiguous input, each prefix object including a number of the characters of the ambiguous input; for each prefix object, seeking a corresponding language object, that corresponds with the prefix object;*

*generating a result by, for each prefix object, identifying word objects which correspond with the prefix object such that a sequence of letters represented by the prefix object is either a prefix of the identified word object or identical to the entirety [sic] of the word object, each identified word object having associated with it a frequency object having a frequency value indicative of a relative frequency of its associated word object within a given language; and associating with the prefix object the highest frequency value of the frequency objects associated with the identified word objects;*

*for at least a portion of the prefix objects of the result, generating an output set of the prefix objects sorted according to the frequency values associated therewith; and*

*outputting an output (64) including the prefix objects of at least a portion of the output set organized in*

*descending order of frequency value; the method further comprising determining that the result includes a quantity of the prefix objects, determining that the quantity of prefix objects in the result is fewer than a predetermined quantity, and adding to the output set at a position corresponding with a relatively low frequency an orphan prefix object [sic] comprising a prefix object for which a corresponding word object (108) was not identified; adding to the output set, at a position corresponding with a relatively low frequency as a first orphan prefix object, a prefix object for which a corresponding word object (108) was not identified, and adding to the output set, at a position corresponding with a relatively low frequency as a second orphan prefix object, another prefix object for which a corresponding word object was not identified, determining a first frequency value and associating the first frequency value with the first orphan prefix object, determining a second frequency value and associating the second frequency value with the second orphan prefix object, and sorting in the output set the first orphan prefix object and the second orphan prefix object in descending order of frequency value; and determining that one of the first orphan prefix object and the second orphan prefix object has a relatively higher priority than the other of the first orphan prefix object and the second orphan prefix object since a final three characters (48) of the one of the first orphan prefix object and the second orphan prefix object correspond with a first n-gram object (112) of the plurality of n-gram objects having three characters, and positioning in the output set the one of the first orphan prefix object and the second orphan prefix object at a position corresponding with a*

*relatively higher frequency than the other of the first orphan prefix object and the second orphan prefix object."*

The second auxiliary request includes a further independent claim directed to a corresponding device (claim 14).

## **Reasons for the Decision**

### 1. Prior art

D1 discloses a method for disambiguating an input sequence on a reduced keypad by dynamically generating all possible permutations and searching for those in a simple database comprising complete words and incomplete words, e.g. prefixes (see column 4, lines 49 to 60). In a specific embodiment illustrated in Figure 5, invalid n-grams, i.e. orphan prefixes, may be displayed in the candidate list (see column 4, lines 65 to 67).

D2 discloses a disambiguation method for reduced keypads (see column 1, lines 9 to 12; column 3, lines 10 to 40; and column 8, line 44 to column 9, line 47). Vocabulary modules contain frequency information which indicates which word/prefix objects are to be displayed first to the user (see column 6, lines 40 to 56; column 17, lines 5 to 33; column 30, lines 1 to 27). Upon entry of an ambiguous input, i.e. a keystroke sequence, a semantic tree is traversed based on the successive keystrokes (see column 14, lines 15 to 33). Each time a key is pressed, the system proceeds to a node associated with a number of vocabulary objects



(prefixes, n-grams or complete words) and a list of objects corresponding to the keystroke sequence is generated. The candidate objects are displayed in descending order based on their frequency of use in a given language (see column 6, lines 40 to 56; column 9, lines 11 to 25; column 13, lines 1 to 64). The complete words are listed before the prefixes, i.e. the incomplete words (see Figure 1A; column 18, line 66 to column 19, line 20). In the case where a prefix corresponds to several possible complete words, the system assigns a composite frequency of the possible words to this prefix object (see column 11, line 40 to column 12, line 4).

D3 discloses a disambiguation method for reduced keyboards, by dynamically generating all possible permutations and searching for these in a simple database (see Figure 4, step 140, 150; column 4, line 30 to column 5, line 5).

2. It was common ground in the oral proceedings before the board that D2 represented the closest prior art.

The subject-matter of claim 1 of the second auxiliary request (sole request) differs in substance from the disclosure of D2 in that:

- i) instead of traversing a semantic tree as in D2, the disambiguation function is performed by generating prefix objects based on the ambiguous input sequence and then seeking language objects corresponding to each of these prefix objects,
- (ii) for each prefix object, the disambiguation function identifies word objects which correspond with the prefix object, each identified word object having associated with it a frequency object having a frequency value, and associates with the prefix object

the highest frequency value associated with the identified word objects that correspond with the prefix object,

- (iii) the disambiguation function presents a list of candidate objects ranked by frequency value which, in contrast to D2, does not make a distinction between prefix objects which are complete words and prefix objects which are identical only to stems of a complete word,

- (iv) a sequence of letters represented by the prefix object is either a prefix of the identified word object or identical to the entirety of the word object,

- (v) it is determined that the result of the disambiguation includes a quantity of the prefix objects, that the quantity of prefix objects in the result is fewer than a predetermined quantity, and there is added to the output set at a position corresponding with a relatively low frequency an orphan prefix object comprising a prefix object for which a corresponding word object was not identified,

- (vi) there is added to the output set, at a position corresponding with a relatively low frequency as a first orphan prefix object, a prefix object for which a corresponding word object was not identified, and there is added to the output set, at a position corresponding with a relatively low frequency as a second orphan prefix object, another prefix object for which a corresponding word object was not identified, a first frequency value is determined and associated with the first orphan prefix object, a second frequency value is determined and associated with the second orphan prefix object, and the first orphan prefix object and the second orphan prefix object are sorted in descending order of frequency value in the output set,

- (vii) it is determined that one of the first orphan prefix object and the second orphan prefix object has a

relatively higher priority than the other of the first orphan prefix object and the second orphan prefix object since a final three characters of the one of the first orphan prefix object and the second orphan prefix object correspond with a first n-gram object of the plurality of n-gram objects having three characters, and the one of the first orphan prefix object and the second orphan prefix object is positioned in the output set at a position corresponding with a relatively higher frequency than the other of the first orphan prefix object and the second orphan prefix object.

3. The board holds that the distinguishing features (i) to (vii) do not provide a synergistic technical effect going beyond the mere addition of their individual technical effects.

3.1 The appellant argued in writing that the feature of ranking the candidate objects by frequency value only, without prioritisation between complete words and incomplete words (feature (iii)), and the feature of assigning to an incomplete word the highest frequency value of the corresponding complete words (feature (ii)) provided a synergistic effect. The board acknowledges that these two features interact since they both have an impact on the content of the displayed candidate list. However, the board does not see that these features have a synergistic effect on the likelihood of the first candidate object correctly reflecting the user's intention. The same applies to the other distinguishing features.

3.2 As support for its line of argument, the appellant relied in writing on its own comparative study between the disambiguation method of the present application, denominated "SureType", and a disambiguation method

allegedly corresponding to the method of D2, denominated "T9". The appellant concluded that the SureType method enabled a user to input more quickly on a reduced keyboard. However, the board is not convinced that the study shows a definitive improvement. The study is based on a limited number of users, 14 SureType experts and 14 T9 experts (see page 2, "User Profile") and a number of typed messages (see page 1, "#msg") which appears to be quite limited with regard to the number of possible objects in a vocabulary module and the number of possible ambiguous input sequences on a 12-key reduced keyboard. For these reasons, the board holds that the study does not show unmistakably that the alleged technical effect is actually achieved.

4. With respect to feature (i), the board agrees with the decision that the problem solved by this feature is to provide a simpler data structure for the language objects. The skilled person is well aware of the trade-off between two possibilities when having to decide on the choice of a database and the inherent search technique. A first possibility is to use a simple data structure requiring less storage but increased processing each time a result is sought, and to dynamically generate all possible permutations and search for those in the database, as illustrated by D1 (see column 4, lines 49 to 60) and D3 (see Figure 4, steps 140 and 150, and column 4, line 30 to column 5, line 5). The second possibility is to perform the search for language objects corresponding to an input sequence in advance and to store this information in the data tree structure, which reduces the processing required to retrieve data but requires more data to be stored. The skilled person wishing to implement a simpler data structure would immediately consider the

approach of storing language objects without a tree data structure, i.e. feature (i), without exercising inventive skill.

5. With respect to feature (ii), the board agrees with the decision that it merely represents an alternative solution to the problem of how to assign a frequency object to a prefix which corresponds to more than one retrieved word object. Whether the user would obtain a better candidate list with individual or with composite frequencies largely depends on the particular intended word. Thus it is not established at all that using feature (ii) would provide an overall improvement in candidate lists when a large number of input sequences is entered. In that respect, the board agrees with the decision under appeal that whether the user obtains a better candidate list with the assignment according to feature (ii) depends on the user's intention and cannot be predicted. By looking for an alternative solution to the issue of assigning a frequency object to a prefix which corresponds to several retrieved words, the skilled person would consider an assignment of the highest frequency value of the retrieved words as an obvious equivalent which they would interchange with the solution of D2 without exercising inventive skill.
  
6. With respect to feature (iii), the board agrees with the decision that ranking the prefixes and the complete words indiscriminately by frequency value represents a mere alternative to the ranking of D2 which itself prioritises the complete words. Whether the user would obtain a better candidate list with or without this prioritised ranking largely depends on the particular intended word. Thus it is not established at all that using feature (iii) would provide an overall improvement in candidate lists when a large number of

input sequences is entered. By looking for an alternative to the prioritisation of complete words in relation to incomplete words in the candidate list, the skilled person would obviously consider not giving any priority to words or incomplete words, as illustrated for instance in D1 (see column 4, lines 44 to 48).

7. With respect to feature (iv), the board agrees with the decision that it represents an inherent property of objects stored in the language database previously defined in claim 1 and comprising complete words and n-gram objects. It is also already disclosed in D2 (see column 18, line 66 to column 19, line 20). Therefore feature (iv) cannot contribute to inventive step.
8. Feature (v) relates to the inclusion of orphan prefix objects in the output set when the number of identified prefix objects is less than a predetermined quantity. However, this is disclosed by D1 wherein, in a specific embodiment illustrated in Figure 5, invalid n-grams, i.e. orphan prefixes, may be displayed in the candidate list (see column 4, lines 65 to 67).
9. Feature (vi) relates to the ranking of two orphan prefix objects according to associated frequency values. Since such a ranking is already performed among words and incomplete words, it is obvious that the skilled person would rank the displayed orphan prefix objects according to frequency values stored in the database.
10. Feature (vii) relates to assigning frequency values to orphan prefix objects by taking the final three characters of an orphan, checking if it corresponds with an n-gram object and taking its frequency value as that of the orphan.

10.1 The board agrees with the decision that an orphan prefix object, not being by definition a word or word stem, cannot have a frequency value in the language database. Therefore the skilled person would have to assign such a frequency value to each orphan prefix object for the purpose of ranking. An obvious choice would be to take the frequency attribute from a similar word or word stem. The board further agrees with the decision that taking the final three characters of an orphan for checking if it corresponds with an n-gram object as a similarity check does not provide a particular technical effect. Moreover, such a technical effect is also not mentioned in the description. Hence this feature must be construed as a mere design option for assigning a frequency value to an orphan prefix object. The board holds that the skilled person, when looking for a way to attribute a frequency value to an orphan prefix object, would consider taking the frequency value of a similar word or word stem corresponding to part of the orphan prefix object, in particular to its final three characters, without exercising inventive skill.

10.2 The above-mentioned reasons why feature (vii) could not contribute to inventive step were outlined in the decision and endorsed by the board in the communication presenting its preliminary opinion, whereas the appellant has not provided any argument in that respect in the statement setting out the grounds of appeal.

However, at the oral proceedings before the board, the appellant relied with respect to feature (vii) on a new line of argument based on an explanatory example which had not been presented before at any stage of the examination and appeal proceedings. On the basis of this example, the appellant argued that this feature

led to the effect of improved disambiguation in the case of an orphan being the result of mis-keying, with reference to paragraphs [0064] of the description as originally filed, regarding possible origins of orphans, and [0104] to [0106], regarding the ranking of orphan prefix objects. The appellant argued that the late submission of these arguments was due to the fact that the present representative had been in charge of the file only since the statement setting out the grounds of appeal had been filed. Moreover, the appellant argued that the new line of argument was only a refinement of the general argument that the subject-matter of the second auxiliary request involved an inventive step presented in the statement of grounds of appeal, and thus did not constitute an amendment of the appeal case.

Article 12(3) RPBA 2020 requires that a party to appeal proceedings set out its complete case in its statement of grounds of appeal, in particular its arguments. Contrary to the appellant's argument, the board considers that in the present case the new line of argument goes beyond a mere refinement of the arguments submitted in the statement of grounds of appeal, arguing without further substantiation that D2 neither disclosed nor suggested the combined features. Neither the explanatory example nor the alleged effect nor the disclosure of paragraphs [0064] and [0104] to [0106] had been presented or discussed before. Therefore the new line of argument submitted by the appellant during the oral proceedings before the board constitutes an amendment to the party's appeal case (see for instance T0319/18, T1108/16).

According to Article 13(2) RPBA 2020, which is applicable in the present case under Article 25(1) and



(3) RPBA 2020, amendments to a party's case made after notification of a summons to oral proceedings are not to be taken into account unless there are exceptional circumstances, justified with cogent reasons. In the present case, the change of representative, according to the case law, is not considered an exceptional circumstance justifying the late filing of submissions (see for instance T1904/16). Further, as the board confirmed the finding of the decision of the examining division with respect to the second auxiliary request and did not raise any new issues in its preliminary opinion, there had been no change in the subject of the appeal proceedings once the statement of grounds of appeal had been filed. Thus the preliminary opinion of the board cannot be regarded as a justification for the new line of argument, which itself amounts to an amendment of the appellant's case as set out above.

Consequently, the board decided to exercise its discretion and not to admit the new line of argument.

11. For these reasons, the board holds that the second auxiliary request (sole request) is not allowable under Article 56 EPC.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated