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Datasheet for the decision of 3 July 2015

Case Number: T 2230/10 - 3.5.07

Application Number: 99923793.6

Publication Number: 1036367

IPC: G06F17/30

Language of the proceedings: EN

Title of invention:
Context-based and user-profile driven information retrieval

Applicant:
Koninklijke Philips N.V.

Headword:
Context-based information retrieval/PHILIPS

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - all requests (no)

Decisions cited:
T 0027/97, T 0258/97, T 0258/03, T 0928/03, T 0154/04, T 0354/07, T 1358/09, T 2035/11

Catchword:

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Case Number: T 2230/10 - 3.5.07

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 3 July 2015

Appellant: (Applicant)	Koninklijke Philips N.V. High Tech Campus 5 5656 AE Eindhoven (NL)
Representative:	Gravendeel, Cornelis Philips Intellectual Property & Standards P.O. Box 220 5600 AE Eindhoven (NL)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 7 June 2010 refusing European patent application No. 99923793.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Moufang
Members:	R. de Man
	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. 99923793.6, which was filed as international application PCT/IB99/01089 and published as WO 99/67698.

II. The Examining Division decided that a main request and first and second auxiliary requests complied neither with Article 123(2) EPC nor with Articles 52(1) and 56 EPC. The objections of lack of inventive step were based on the following document:

D1: Bhatia S.: "Selection of Search Terms Based on User Profile", Proceedings of the 1992 ACM/SIGAPP Symposium on Applied Computing: Technological Challenges of the 1990s, pp. 224-233, 1992.

III. With the statement of grounds of appeal, the appellant filed a main request and first and second auxiliary requests identical to those considered in the decision under appeal.

IV. In a communication accompanying a summons to oral proceedings, the Board expressed the preliminary view that none of the requests complied with Article 123(2) EPC and that the subject-matter of claim 1 of each request lacked inventive step in view of document D1.

V. With a letter dated 28 May 2015, the appellant replaced its substantive requests with a main request and first to fifth auxiliary requests. The main request, second auxiliary request and fifth auxiliary request were identical to the previous main request, first auxiliary request and second auxiliary request, respectively.

VI. In the course of oral proceedings held on 3 July 2015, the appellant submitted a new auxiliary request 1A. At the end of the proceedings, the chairman pronounced the Board's decision.

VII. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request or, in the alternative, on the basis of the claims of one of the first auxiliary request, auxiliary request 1A, and the second to fifth auxiliary requests.

VIII. Claim 1 of the main request reads as follows:

"A method of enabling a user to query an electronic document base, the method comprising the steps of:
- allowing a user to enter query words;
- generating one or more additional keywords based on a profile of the user; and
- searching in an electronic document base for documents that match the combination of query words and additional keywords,
characterized by further comprising the steps of:
- generating a set of concept keywords based on the results of the search;
and
- storing the set of concept keywords in a dynamic part of the profile of the user."

IX. Claim 1 of the first auxiliary request reads as follows:

"A method of enabling a user to query an electronic document base, the method comprising the steps of:

- allowing a user to enter query words representing a first query;
- generating one or more additional keywords based on the entered query words and a static part of a profile of the user, the static part of the profile of the user comprising data which is indicative of the user's long-term interests;
- searching in an electronic document base for documents that match the combination of query words and additional keywords;
- returning results of the search to the user;
characterized by further comprising the steps of:
- generating a set of concept keywords based on the results of the search;
- storing the set of concept keywords in a dynamic part of the profile of the user; and
- when the user starts a second query by entering one or more new query words, also using the dynamic part of the profile when generating one or more additional keywords for the second query."

X. Claim 1 of auxiliary request 1A is identical to claim 1 of the first auxiliary request.

XI. Claim 1 of the second auxiliary request differs from claim 1 of the main request in that its characterising part reads as follows:

"- generating a set of concept keywords based on the results of the search;
- storing the set of concept keywords in a dynamic part of the profile of the user;
- detecting a context shift when the distance between a newly entered query word and the concept keywords stored in the dynamic part of the profile of the user is sufficiently large; and

- disregarding said concept keywords stored in the dynamic part of the profile of the user upon detecting said context shift."

XII. Claim 1 of the third auxiliary request differs from claim 1 of the first auxiliary request in the removal of the word "and" from the end of the penultimate step and in the addition of the following text:

"- detecting a context shift when the degree of overlap between i) the one or more newly entered query words and ii) the combination of the first query and the additional keywords generated for the first query, is insufficiently large; and
- when generating the one or more additional keywords for the second query, disregarding concept keywords stored in the dynamic part of the profile of the user that are associated with the search results of the first query upon detecting said context shift."

XIII. Claim 1 of the fourth auxiliary request differs from claim 1 of the third auxiliary request in that "A method ... an electronic document base" is followed by

"comprising documents spanning an information space"

and that the following text is inserted after "detecting a context shift ... is insufficiently large":

"so as to determine that the second query pertains to a different part of the electronic document database's information space than the first query"

XIV. Claim 1 of the fifth auxiliary request differs from claim 1 of the second auxiliary request in the

insertion of the following text after "detecting a context shift ... is sufficiently large":

", said distance being obtained by computing a degree of overlap between successive query terms"

Reasons for the Decision

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

2. *The invention*

2.1 The invention relates to retrieval of information from an electronic document base on the basis of search queries. The application *inter alia* explains that if a search query is not very precise, a large percentage of the results returned by existing search engines will not be relevant to the user. The invention hence aims to improve the quality of returned search results by making search queries more precise. To this end, it keeps track of the context in which the user is searching, and it uses this context to supplement query words entered by the user with "additional keywords".

2.2 The search context is tracked by means of a user profile which comprises a static part and a dynamic part. The static part represents the user's long-term interests and is initialised, for example, on the basis of information provided by the user about his or her fields of interest. The dynamic part is intended to reflect the user's current focus. It contains "concept keywords" that are generated on the basis of the results returned by his or her previous searches.

2.3 The description of the application does not contain much detail on how the static and dynamic parts of the user profile are represented, nor on how additional keywords and concept keywords are generated. At the oral proceedings, the appellant submitted that, as stated on page 5, lines 18 to 21, the relevant algorithms were all known from the literature.

3. *Main request - inventive step*

3.1 Document D1 relates to a method of selecting additional search terms to be added to a search query on the basis of a user profile and the terms of the query in order to improve "retrieval effectiveness" (see title, abstract, and page 232, left-hand column, second full paragraph, to page 232, right-hand column, up to "A preliminary experiment ..."). Document D1 hence discloses the features of the preamble of claim 1 in combination.

3.2 The user profile of document D1 comes in the form of a "concept (construct) dependence tree" created by means of "personal construct theory" involving active user participation (see abstract). In this approach, the user identifies "a vocabulary (concepts) that is natural to him/her" and rates documents from a learning set against the concepts identified (page 225, right-hand column, last paragraph). The user profile of document D1 is hence "static" in the sense of the present application.

3.3 The subject-matter of claim 1 of the main request differs from the method of document D1 in that the user profile further contains a "dynamic part" in which "concept keywords" are stored that are generated on the basis of the results of a search.

It follows from the description of the published application on page 4, lines 23 to 27, in combination with page 5, lines 22 to 26, that the (updated) dynamic part of the user profile is taken into account in the step of generating the "additional keywords" for the (next) query. For the assessment of inventive step, the Board will interpret claim 1 accordingly.

3.4 These distinguishing features modify the algorithm that is used to generate the keywords which are added to a search query before it is handed over to a search engine. In document D1, the additional keywords are generated on the basis of the query terms and a user profile which does not change between queries. In the present invention, the additional keywords are generated on the basis of the query terms and a user profile which comprises a portion containing "concept keywords" derived from the results returned by previous search queries.

Although abstract algorithmic features as such are excluded from patentability (Article 52(2)(c) and (3) EPC), they may provide a technical contribution to the extent that they interact with the technical subject-matter of the claim for solving a technical problem (see decision T 154/04, OJ EPO 2008, 46, reasons 5, under (F), and reasons 13).

3.5 In this respect, the appellant argued that the distinguishing features led to increased query specificity and thus addressed a technical challenge in the field of document retrieval. Some query terms denoted different concepts depending on the context. The term "processor", for example, might have the meaning of "food processor" in the context of cooking

and of "microprocessor" in the context of computers. A search directed to such a query term might therefore return documents from different parts of the document repository and thereby return a larger amount of documents than if the search had been limited to one of the concepts. Search results comprising too many documents could be useless even if they included the relevant documents. An increase in query specificity was therefore a technical result already on its own.

In addition, an inherent consequence of increased query specificity in the context of information retrieval was that the search returned a reduced number of documents. That was a technical effect since the skilled person would immediately recognise the causal link with at least the following real tangible benefits:

- a reduction of bandwidth usage between the electronic document base and the presentation mechanism when communicating the results of the search;
- a lower load on the document retrieval mechanism, for example in the form of fewer hard disk drive seek and read operations; and
- reduced complexity for the presentation mechanism which, for example, would not need to provide a multi-page graphical user interface.

Referring to decisions T 27/97 of 30 May 2000, T 258/97 of 8 February 2002 and T 354/07 of 27 January 2010, the appellant argued that features causally linked to a technical effect could not be disregarded in assessing inventive step. Referring to decision T 928/03 of 2 June 2006, it submitted that the mere fact that non-technical aspects might be involved did not cancel out the technical effect of a reduced number of search results.

The appellant further submitted that increased query specificity led to different parts of the electronic document base being accessed and therefore had an effect on search complexity.

3.6 The Board notes that the determination of the claim features which contribute to the technical character of the invention is made, at least in principle (the question may in practice be left open for features which anyway are part of the closest prior art), without reference to the prior art (see T 154/04, *supra*, as explained in T 1358/09 of 21 November 2014, reasons 5.4). That the claimed invention might achieve better results than the method of document D1 is therefore in itself not an indication that the algorithmic modification is technical, although it may be important in the assessment of inventive step once technicality has been established. Technicality is hence more about control of technical parameters than about improvement.

3.7 Furthermore, while the appellant is correct that the case law of the boards of appeal generally recognises a technical contribution of non-technical features if they are causally linked to a technical effect, it is not the case that any physical change qualifies as a technical effect.

For example, in decision T 258/97 cited by the appellant, the board considered that changing a dialling and redialling sequence changed the operation of a communication apparatus and thus indisputably caused a physical effect, but that it was doubtful that changing the sequence had any technical effect in the

sense of a physical effect which was purposively used in the solution of a technical problem (see reasons 6).

Similarly, in decision T 258/03, OJ EPO 2004, 575, the board admitted that certain features corresponding to the rules of an auction when performed in a server computer changed the overall state of that computer, but it did not regard this as a technical effect (reasons 5.4). Consequently, the fact that those auction rules eliminated certain data transmission delays when compared to the prior art did not contribute to an inventive step (reasons 5.7).

The other decisions cited by the appellant do not deviate from this approach.

3.8 The Board considers that, for the purpose of determining the technical contribution of the algorithm underlying the present invention, a physical effect resulting from a particular choice of additional keywords is only to be taken into account as a technical effect to the extent that the choice or, equivalently, the algorithm is based on technical considerations (cf. decision T 2035/11 of 25 July 2014, reasons 5.2.3).

3.9 At the oral proceedings, the appellant conceded that the insight that a query term might have different meanings depending on the query's context was of a non-technical linguistic nature, but in its view the linguistic considerations relevant to claim 1 were limited to that insight.

In the Board's view, the algorithm for selecting additional keywords underlying claim 1 is fully determined by considerations that are, in a broad

sense, linguistic. The "context" determining the meaning of otherwise ambiguous query terms is a linguistic concept. That the context for a user's search query may be related to the user's long-term interests is similarly linguistic in nature. The Board considers that the same holds true for the idea that the context may be related to "concept keywords" derived from the results returned by previous queries, for example on the basis of the textual content of the returned documents.

3.10 The Board is aware that where the formulation of an algorithm can be "explained" as the outcome of a series of non-technical considerations, this does not rule out the possibility that the algorithm, in its claimed context, may also reflect certain technical considerations. But in the present case the Board is not able to identify any such considerations.

In particular, the algorithm does not reflect technical considerations regarding search complexity and the parts of the electronic document base which are being accessed (see point 3.5, last paragraph). The application as filed in fact does not contain any details of the technical structure of the electronic document base and its associated search engine; so it cannot be seen how technical control over the functioning of those entities can be exercised through a suitable choice of additional keywords.

The Board also does not accept that the algorithm is based on technical considerations in that it has been purposively designed with a view to the relevance to the user of the search results obtained, as this relates to the cognitive content of the returned documents.

3.11 The Board concludes that the conceptual algorithm for generating additional keywords underlying claim 1 does not contribute to the technical character of the invention, so an inventive step can be present only in its technical implementation. Since the claim in this respect does not specify any details, and since the description of the application merely states that the required algorithms are known in the art (see page 5, lines 18 to 21, of the published application), it must be assumed that the skilled person would have no difficulty in implementing the steps of generating concept keywords based on the results of the search and generating additional keywords based *inter alia* on those concept keywords.

3.12 At the oral proceedings, the appellant attempted to draw an analogy with methods in the field of audio and video processing. However, such methods are typically not based on linguistic considerations.

3.13 It follows that the subject-matter of claim 1 lacks inventive step over the method of document D1 (Articles 52(1) and 56 EPC).

4. *First auxiliary request and auxiliary request 1A - inventive step*

4.1 Claim 1 of the first auxiliary request and of auxiliary request 1A largely corresponds to claim 1 of the main request, but clarifies it in several respects. In particular, it explicitly claims the processing of a "first query" and of a "second query". The first query relates to the user's first interaction with the system, when the dynamic part of the user's profile is still empty (see page 4, lines 23 to 25, of the

description). After concept keywords have been generated on the basis of the results of the first query, the dynamic part is no longer empty and is hence taken into account when the second query is processed (see page 5, lines 22 to 25).

Claim 1 further specifies that generating additional keywords is based also on the entered query words, makes explicit that the user profile comprises a static part, and clarifies that search results are returned to the user in addition to being used for generating concept keywords.

4.2 In document D1, the user profile is a "static profile", and additional keywords are generated on the basis of both the entered query words and the user profile (see points 3.1 and 3.2 above). In addition, it is at least obvious that retrieved search results are returned to the user.

Since the Board has furthermore already interpreted claim 1 of the main request to mean that an (updated) dynamic part of the user profile is taken into account in the step of generating the additional keywords for the (next) query (see point 3.3 above), the inventive step reasoning set forth under point 3. still applies.

4.3 The subject-matter of claim 1 of the first auxiliary request and of auxiliary request 1A hence lacks inventive step (Articles 52(1) and 56 EPC).

5. *Second auxiliary request - inventive step*

5.1 Claim 1 of the second auxiliary request adds to claim 1 of the main request steps of detecting a "context

shift" and of "disregarding" the stored concept keywords upon detecting the context shift.

The context shift is detected by determining whether "the distance between a newly entered query word and the concept keywords stored in the dynamic part of the profile of the user is sufficiently large".

5.2 The application does not ideally explain how the "distance" between a query word and concept keywords is to be calculated. According to the description on page 6, lines 32 and 33, the distance may be obtained "by computing a degree of overlap between successive query terms". However, concept keywords are not (previous) query terms. Nevertheless, for the purpose of assessing inventive step the Board accepts that the skilled person is able to implement a suitable "distance" measurement.

5.3 Similarly, the application as filed could have explained the actions to be taken in response to a context shift in more precise terms. However, for the purpose of assessing inventive step it suffices that, as the appellant acknowledged at the oral proceedings, according to one possible embodiment the concept keywords stored in the dynamic part of the profile are deleted upon detecting a context shift and therefore "disregarded" until new concept keywords have been generated.

5.4 The added features extend the algorithm for generating additional keywords with a step of detecting, on the basis of a linguistic analysis of a newly entered query, whether the user's current focus and consequently the proper "context" for determining the meaning of otherwise ambiguous query terms may have

changed, and a step of essentially reverting to the user's long-term interests upon detecting that the user's current focus has changed. In the Board's view, these are again non-technical linguistic considerations.

5.5 It follows that the features added to claim 1 cannot overcome the inventive step objection raised against claim 1 of the main request. The subject-matter of claim 1 of the second auxiliary request hence likewise lacks inventive step (Articles 52(1) and 56 EPC).

6. *Third auxiliary request - inventive step*

6.1 Claim 1 of the third auxiliary request adds to claim 1 of the first auxiliary request similar steps of detecting a "context shift" and of "disregarding" the stored concept keywords upon detecting the context shift.

6.2 The context shift is now detected by determining whether "the degree of overlap between i) the one or more newly entered query words and ii) the combination of the first query and the additional keywords generated for the first query, is insufficiently large". This step is hence specified in more detail than in claim 1 of the second auxiliary request, but the added detail concerns the specification of the linguistic analysis, which is still non-technical.

6.3 The claim specifies explicitly that concept keywords "associated with the search results of the first query" are disregarded "when generating the one or more additional keywords for the second query". This is essentially how the Board interpreted the step of

"disregarding" in claim 1 of the second auxiliary request (see point 5.3 above).

6.4 It follows that these amendments cannot overcome the lack of inventive step. The third auxiliary request is hence likewise not allowable (Articles 52(1) and 56 EPC).

7. *Fourth auxiliary request - inventive step*

7.1 Claim 1 of the fourth auxiliary request adds to claim 1 of the third auxiliary request that the electronic document base being searched comprises "documents spanning an information space". In addition, the step of "detecting a context shift" is qualified with the feature "so as to determine that the second query pertains to a different part of the electronic document database's information space than the first query".

7.2 The Board considers that these amendments do not further limit the subject-matter claimed. Documents in an electronic document base contain information and therefore can be said to "span an information space". Similarly, the feature "so as to determine ... the first query" does not limit the step of "detecting a context shift", since the claim already specifies how the step of detecting is to be performed.

7.3 The subject-matter of claim 1 of the fourth auxiliary request therefore does not involve an inventive step (Articles 52(1) and 56 EPC).

8. *Fifth auxiliary request - inventive step*

8.1 Claim 1 of the fifth auxiliary request adds to claim 1 of the second auxiliary request that the "distance"

between a query word and the concept keywords is obtained "by computing a degree of overlap between successive query terms".

8.2 As observed in point 5.2 above, this definition appears to be somewhat contradictory, as concept keywords are not query terms. In any event, the context shift is still determined on the basis of a linguistic analysis, so that this amendment cannot overcome the lack of inventive step.

8.3 The fifth auxiliary request is hence not allowable for lack of inventive step in the subject-matter of claim 1 (Articles 52(1) and 56 EPC).

9. *Conclusion*

Since none of the requests on file is allowable, the appeal is 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