

Internal distribution code:

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

**Datasheet for the decision
of 21 June 2013**

Case Number: T 1518/09 - 3.5.06

Application Number: 07003330.3

Publication Number: 1832978

IPC: G06F 9/50, G06F 9/44

Language of the proceedings: EN

Title of invention:

A method and a system for cascaded processing a plurality of data objects

Applicant:

SAP AG

Headword:

Cascaded processing/SAP

Relevant legal provisions:

RPBA Art. 12(4)

Relevant legal provisions (1973):

EPC Art. 56

Keyword:

"inventive step - all requests (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 1518/09 - 3.5.06

D E C I S I O N
of the Technical Board of Appeal 3.5.06
of 21 June 2013

Appellant:
(Applicant)

SAP AG
Dietmar-Hopp-Allee 16
D-69190 Walldorf (DE)

Representative:

Hössle Patentanwälte Partnerschaft
Postfach 10 23 38
D-70019 Stuttgart (DE)

Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted 27 February 2009
refusing European patent application
No. 07003330.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: D. H. Rees
Members: M. Müller
C. Heath

Summary of Facts and Submissions

I. The appeal lies against the decision of the examining division, dated 27 February 2009, to refuse the European patent application 07003330.3.

II. The relevant procedure before the examining division can be summarized as follows.

(a) The examining division summoned the applicant/appellant to oral proceedings with a communication dated 28 October 2008. In the annex to the summons it argued that the pending claims lacked an inventive step, Article 56 EPC 1973, in view of documents

D1: WO 03/060748 A2 and

D3: Moore R. W., "Knowledge-based Grids", Proc. of the 18th IEEE symposium on Mass Storage Systems and Technologies (MSS'01), pp. 29-40, IEEE Press, 2003.

The pending claims were further objected to as lacking conciseness, Rule 29 (2) EPC 1973 in combination with Article 84 EPC 1973, and objections under Article 83 and 84 EPC 1973 were also raised.

(b) In response, the applicant/appellant filed amended claims and further arguments. These were discussed with the primary examiner on the telephone on 22 January 2009. According to the minutes of that telephone consultation, the examiner argued that the inventive step objection from the summons continued to apply, indicated which of the objections

under Article 83 and 84 EPC 1973 were maintained, and addressed the applicant/appellant's arguments which had been submitted with the amendments. The minutes of the telephone consultation bear the date 27 January 2009, but an advance copy was sent to the applicant by telefax on 23 January 2009.

- (c) By telefax of 26 January 2009, the applicant/appellant indicated that it would not participate in the scheduled oral proceedings and requested a decision "according to the state of the file".
- (d) Accordingly, the decision was delivered in abridged form reading as follows:

"In the communication(s) dated 28.10.2009, 27.01.2009 the applicant was informed that the application does not meet the requirements of the European Patent Convention. The applicant was also informed of the reasons therein. The applicant filed no comments or amendments in reply to the latest communication but requested a decision according to the state of the file by a letter received in due time on 26.01.2009."

III. Notice of appeal was filed on 21 April 2009, the appeal fee being paid on the same day, and a statement of grounds was received on 5 June 2009. The appellant requested that the decision be set aside and a patent be granted based on a set of claims as filed with the grounds of appeal.

IV. With summons to oral proceedings, the board informed the appellant of its preliminary opinion. The board set

out how, in its view, the claims had to be construed and raised a clarity objection, Article 84 EPC 1973. The board further addressed the question which of the claimed features had to be considered to be part of the problem rather than the solution, and expressed its doubts as to whether the invention as claimed achieved the desired technical effect of reduced processor idle time. The board also raised an inventive step objection in view of D1, Article 56 EPC 1973.

- V. In response to the summons, by telefax on 21 May 2013, the appellant filed two auxiliary requests. During oral proceedings, the appellant filed amended claims according to a new 1st auxiliary request to replace the pending 1st auxiliary request. It requested that a patent be granted based on the following application documents:

claims, no.

- 1-13 filed with the grounds of appeal on 5 June 2009
- 1-13 filed during oral proceedings on 21 June 2013, according to the 1st auxiliary request, or
- 1-13 as filed with letter dated 21 May 2013, according to the 2nd auxiliary request

description, pages

- 1-7, 10-16, 18 as originally filed
- 8, 9, 17, 19 filed with letter dated 17 December 2008

drawings, sheets

- 1/3-3/3 as originally filed

- VI. Claim 1 according to the main request reads as follows:

"A method for cascaded processing a plurality of data objects using a data-processing system comprising a plurality of processors, each data object being

assigned to a folder among a plurality of folders (1, ..., N), wherein a main process (M) distributes the plurality of folders (1, ..., N) to a corresponding number of parallel processes of the first tier of processes, each parallel process selects the data objects to be processed for the respective folder, splits the selected data objects into a plurality of packages, and distributes the packages of the plurality of packages to a corresponding number of second tier parallel processes, which respectively process each of the plurality of packages distributed, and respective results of the processed packages are collected from all second tier parallel processes in a single log which is reported back to the main process."

Claim 1 according to the 1st auxiliary request reads as follows:

"A method for cascaded processing a plurality of data objects using a data-processing system comprising at least a main computing unit (CPU_M) and a plurality of sub-computing units (CPU_1, ..., CPU_N) for a first tier of processes and a plurality of processors (CPU_i,j) for a second tier of processes, each data object being assigned to a folder among a plurality of folders (1, ..., N), wherein a main process (M) running on the main computing unit (CPU_M) distributes the plurality of folders (1, ..., N) to a corresponding number of parallel processes of the first tier of processes, each parallel process of the first tier of processes running on an available sub-computing unit among the plurality of sub-computing units for the first tier of processes selects the data objects to be processed for the respective folder, splits the

selected data objects into a plurality of packages, and distributes the packages of the plurality of packages to a corresponding number of second tier parallel processes, each second tier process of the corresponding number of second tier parallel processes a package of the plurality of packages distributed, and respective results of the processed packages are collected from all second tier parallel processes of the corresponding number of second tier parallel processes in a single log which is reported back to the main process wherein each second tier process is performed by a processor among the plurality of processors for the second tier of processes."

Claim 1 of the second auxiliary request differs from that of the first auxiliary request in that the "main process" is said to be "running on the main process processor (CPU_M)" instead of a "computing unit", the formed packages are said to be "of appropriate size", and in containing the additional feature at the end:

"... which have a higher computing capacity than the sub-computing units used for the first tier of processes."

VII. At the end of the oral proceedings, the chairman announced the decision of the board.

Reasons for the Decision

The decision according to the state of the file

1. According to the decision under appeal, the applicant/appellant had requested a decision according to the state of the file by a letter received on 26 January 2009. The decision however refers to a communication dated 27 January 2009, *i.e.* a day after the request. In fact however this communication, the minutes of a telephone conversation, was sent out, as an advance telefax copy, already on 23 January 2009 and thus before the request on 26 January 2009 was made. The board therefore deems the reference to 27 January instead of 23 January to be made in obvious error. The board also notes that the appellant did not argue that this deficiency in the decision had caused it any disadvantage.

The invention

2. In general terms, the application is concerned with an architecture for parallel data processing. A preferred application for the invention is in the field of funds management, specifically the processing of carry-forward commitments at the end of a fiscal year (see description as published, par. 2).
 - 2.1 The data to be processed is associated to a number of different accounts - or, "more generally", as the application puts it, to a number of different "folders" (see par. 41).

- 2.2 The application discloses two "conventional scenarios" for performing this processing task, one of which is the following (see fig. 2 and pars. 38-40): A main process - running on an appropriate CPU - "assigns" each account for processing to a free CPU. Each such parallel process "selects" the data objects associated with the assigned account and then processes them. Once the process finishes, it reports back its result to the main process. It is observed that individual processes may finish ahead of others since the processing requirements for different accounts or folders may vary considerably (see fig. 2 and par. 39, last sentence) which may cause an "unreasonably long" idle time for some processors (par. 40).
- 2.3 To address this problem and to reduce the overall processing time, the application proposes an alternative architecture, according to which each account is processed by two tiers of processes (see fig. 3 and pars. 41-42): As in the conventional scenario just described, a main process distributes the plurality of folders to a number of parallel processes of the "first tier" each of which is to run on an "available CPU amongst a plurality of CPUs". Each of these first tier processes "selects" the data to be processed and distributes them, split into packages of "appropriate size" (see original claim 1), to an "appropriate number" of second tier processes for processing (par. 42). The results of this processing will be collected in a "single log which is reported back to the main process" (see pars. 7 and 46).

Terminological issues and claim construction

3. In the application a clear distinction is made between the terms "process", in most instances "parallel process", and "processor" or "CPU".
 - 3.1 The application discloses that the "main process ... run[s] on an appropriate CPU", that each of the different accounts is to be processed on an "available CPU" (first tier) and that, likewise, each package is processed by a "respective CPU" (second tier; see pars. 41 and 42).
 - 3.2 In the board's understanding, the parallel processes constitute the computational units which may be distributed over CPUs. The application leaves open, however, whether and when the parallel processes are distributed to different processors for simultaneous execution.
 - 3.3 The skilled person would find it unrealistic to assume that there is a sufficient number of processors to run all parallel processes simultaneously. In a typical instance of the disclosed funds management there will be a very large number of accounts - say, at least hundreds - and a correspondingly larger number of packages - thousands, say. Moreover, the application discloses (par. 52) that the invention is meant to be implemented on a large variety of different and conventional hardware platforms including those which typically provide only one or only a very small number of separate processing units (e.g. merely two in a dual core processor).

- 3.4 In the board's view, therefore, the skilled person would take the application to disclose that the different "parallel processes" are distributed according to availability of the appropriate processors and that the same processor may have to execute more than one process sequentially. The appellant confirmed this interpretation during the oral proceedings.
4. Claim 1 of all three requests specifies that the "packages" relating to one folder are "distribute[d] ... to a corresponding number of second tier processes".
- 4.1 According to the appellant this is intended to mean that the number of "second tier processes" is "adapted to the number of packages ... formed by [the] respective first tier processes" (see grounds of appeal, p. 2, lines 15-18), so that the larger a folder is the more second tier processes are provided to process it. This is argued to follow from the analogous language used for the first tier and the disclosure that N CPUs are used to process N folders (see original claim 1 and par. 41). Moreover, the appellant argued during the oral proceedings that the claims had to be construed as specifying that this selection was made dynamically, *i.e.* on need during processing.
- 4.2 The board concedes that original claim 1 uses the term "corresponding" for both tiers, referring to "a plurality of folders" and a "corresponding number of ... first tier ... processes", as well as to "packages" and a "corresponding number of further parallel processes" but notes that the description discloses distribution of the packages to an "appropriate" - rather than "corresponding" - "number" of second tier processes

- (par. 42). The description, therefore, does not support the view that the two occurrences of "corresponding" in claim 1 must be interpreted in the same way.
- 4.3 It is disclosed in figure 3 that the number of second tier processes may be different for different first tier processes (see, e.g., CPU_4,2 and 1 as opposed to CPU_N,4 - CPU_N,1; see also par. 43). It is not, however, disclosed that the number of second tier processes is chosen dynamically in view of the size of the folder to be processed or how this would have to be done. In the board's view it is consistent with the description that the number of second tier processors be fixed per individual first tier process so that, for instance, the packages of some first tier processes are executed on quad-core processors and those of others on dual-core processors.
- 4.4 The description and the claims also do not imply, in the board's view, that the number of second tier processes corresponds to a varying number of packages. The description discloses that packages "of appropriate size" are formed but does not disclose that all packages must have the same size. Rather, packages might be formed in view of how many second tier processors are available for a particular first tier process so that folder data might be split into four equal-sized packages if a quad-core processor is available and in two equal packages if only a dual-core processor is available.
5. The independent claims specify that "respective results of the processed packages are collected from all second tier parallel processes in a single log which is repor-

ted back to the main process". This language neither implies when, how and under the control of which process the results are collected, nor what the main process is meant to do when they are "reported back" to it. During oral proceedings it was speculated with reference to figure 3 that the rectangular shapes below some second tier process arrows might be intended to represent the "single logs", and that the arrows leading to this shape from neighbouring second tier processes might represent the claimed "collect[ing]" of data. However, this interpretation is not supported by any express statement in the description. Neither the description nor the drawings disclose any specific detail about the implementation of the single log. The board accepts that the skilled person would find ways to implement a single log as claimed without exercising an inventive step and therefore does not consider the functional claim language to be deficient as a result to be achieved or as insufficiently disclosed under Articles 83 or 84 EPC 1973. However, due to the lack of specific disclosure, the pertinent claim language can only be interpreted in very broad terms.

6. In the oral proceedings there was considerable discussion of the limitations implied by the use of the term "folder", together with "assignment" to and "distribution" of said folders, as well as the "selection" of data objects. However, since these features only related to the distribution of the first tier and the appellant has described this stage as "conventional" (fig. 2 and pars. 38-40, an "account" is at any rate one example of a "folder"), the precise meaning of these terms is in fact irrelevant to the judgment of inventive step (see below).

Closest prior art

7. The board considers that the most appropriate starting point for the assessment of inventive step is the conventional scenario described in application itself (see esp. fig. 2) which was summarized above (point 2.2). When this possibility was addressed during oral proceedings, the appellant confirmed that this scenario constituted prior art for the present application in the assessment of inventive step. Hereinbelow, this scenario will be referred to as the "second conventional scenario".

Main request

8. According to claim 1 of the main request, the claimed method is to be executed on "a data-processing system comprising a plurality of processors". Otherwise, claim 1 specifies the method only in terms of *processes* and lacks any detail as to the distribution of parallel processes over different processors.
 - 8.1 For this reason, the board considers that the claimed method cannot be accepted as achieving either a reduction of processor idle time or a reduction of processing time (see the description, pars. 40, last sentence, and par. 45, 1st sentence).
 - 8.2 The appellant suggested during oral proceedings, that the claimed distribution of data processing over several processes might not achieve the speed-up but is instrumental in enabling it: The architecture would make it possible to have high speed processors execute the

actually expensive calculations. No further details of this allegedly technical effect were put forward.

- 8.3 The board notes that the second conventional scenario itself already allows the use of high-speed processors for the implementation of the processes P1-PN (see fig. 2) so that this potential cannot be attributed to the provision of a second tier of processes according to the claimed invention.
- 8.4 The appellant did not provide any other technical effect that the method according to claim 1 of the main request would have or any other technical problem that this method would solve in comparison with the second conventional scenario, nor is the board aware of any.
- 8.5 Hence, for lack of any technical problem that the method according to claim 1 of the main request can be said to solve, the board must conclude that claim 1 lacks an inventive step, Article 56 EPC 1973.

1st auxiliary request

9. It is apparent from the description and common ground between the appellant and the board that the second conventional scenario anticipates all features of claim 1 according to the 1st auxiliary request except for those relating to the second tier. Specifically, it is not disclosed as part of the second scenario that
- i) there is provided a "plurality of second tier processors (CPU_{i,j})" and that each "second tier process is performed by" one of them; that

- ii) each first process "splits the selected data into ... packages" and "distributes [them] to a corresponding number of second tier processes" for processing; and that
- ii) the results are collected from all second tier processes relating to the same folder in a "single log which is reported back to the main process".

10. Differences i) and ii) speed up the overall computation by parallelising the execution of processes P1-PN of the second conventional scenario.

10.1 In the board's view it is commonly known that the execution time of a computational task can be reduced by means of parallelisation. The second conventional scenario itself reflects this fact.

10.2 Therefore, the skilled person looking for further speed up, would naturally and without exercising an inventive step consider potential for further parallelisation. More specifically, it would, in the board's view, naturally occur to the skilled person that each individual process P1-PN could be parallelised, for instance by providing a dedicated multi-core processor for each of them. According to the board's interpretation of the claim language (see point 4.4), this reads on the claimed second tier processors. It is known in the art that to parallelise a task it must be split in sub-tasks. Parallelisation of the processes P1-PN thus directly suggests that the data of each folder be split into "packages" and then distributed to the parallel processors. In the board's view, hence, features i) and ii) would have been obvious for the skilled person trying to speed-up the second conventional scenario.

11. Regarding difference iii), the description discloses (par. 7, last sentence) that the generation of a "very large number of separate result logs ... would ... be very difficult for a user to evaluate", implying, that a "single log" might simplify such evaluation. The broad term "evaluation" however is not specified any further. For lack of detail, the board has to assume that the main process happens to require the combined results for an unspecified evaluation. To satisfy this requirement the skilled person would, in the board's view, consider ways of providing the combined data in a suitable form and find, in the board's view, the claimed solution of "collecting" the results "from all second tier parallel processes in a single log" as one obvious option to do that.

12. The board thus comes to the conclusion that claim 1 of the 1st auxiliary request lacks an inventive step over the second conventional scenario, Article 56 EPC 1973.

2nd auxiliary request

13. Under Article 12(4) RPBA the board of appeal has discretion not to admit requests which could have been presented in the first instance proceedings. In the board's view, this applies, in particular, to the 2nd auxiliary request. Before the first instance, the appellant decided not to attend the scheduled oral proceedings so as to defend its case orally, nor indeed to file any auxiliary requests for the examining division to consider in their decision. Instead, the appellant expressed its interest in a quick termination of the

- first instance proceedings by requesting a decision according to the state of the file.
- 13.1 The board considers that Article 12(4) RPBA would have justified not to admit the 2nd auxiliary request.
- 13.2 In the present case the board decided to admit the request nonetheless because the inventive step of its claims could be dealt with straightforwardly.
14. In substance, claim 1 of the 2nd auxiliary request differs from that of the 1st auxiliary request only in specifying that the processors for the second tier should be chosen to have a higher computing capacity than those for the first tier.
- 14.1 Previously, the board found it obvious for the skilled person to speed-up the individual processes P1-PN of the second conventional scenario using parallel hardware.
- 14.2 To further increase the speed-up it would, in the board's view, have also been immediately obvious for the skilled person to use not only parallel hardware but also fast individual processors, including, if available and affordable, processors with a higher computing capacity than those for the first tier.
- 14.3 This appellant did not challenge this argument during oral proceedings.
- 14.4 The board thus concludes that claim 1 of the 2nd auxiliary request also lacks an inventive step over the second conventional scenario, Article 56 EPC 1973.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

B. Atienza Vivancos

D. H. Rees