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**Datasheet for the decision
of 7 March 2017**

Case Number: T 2015/12 - 3.5.06

Application Number: 06734338.4

Publication Number: 1854004

IPC: G06F9/46

Language of the proceedings: EN

Title of invention:
DISTRIBUTION OF JOB IN A PORTABLE FORMAT IN DISTRIBUTED
COMPUTING ENVIRONMENTS

Applicant:
The MathWorks, Inc.

Headword:
Job distribution/MATHWORKS

Relevant legal provisions:
EPC 1973 Art. 84

Keyword:
Claims - clarity after amendment (yes)
Remittal to the department of first instance

Decisions cited:

Catchword:

Case Number: **T 2015/12 - 3.5.06**

D E C I S I O N
of Technical Board of Appeal 3.5.06
of 7 March 2017

Appellant:	The MathWorks, Inc.
(Applicant)	3 Apple Hill Drive
	Natick, MA 01760 (US)
Representative:	Müller-Boré & Partner
	Patentanwälte PartG mbB
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	80639 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 23 April 2012 refusing European patent application No. 06734338.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	W. Sekretaruk
Members:	M. Müller
	S. Krischer

Summary of Facts and Submissions

I.   The appeal lies against the decision of the examining
        division, with reasons dated 23 April 2012, to refuse
        European patent application No. 06 734 338.4 for lack
        of clarity.

II.   A notice of appeal was filed on 2 July 2012, the appeal
        fee being paid on the same date. A statement of grounds
        of appeal was received on 31 August 2012. The appellant
        requested that the decision be set aside and that a
        patent be granted on the basis of the claims subject to
        the decision (main request) or, alternatively, on the
        basis of one of four sets of claims filed with the
        grounds of appeal (auxiliary requests 1 to 4), the
        other documents on file being the description, pages 2
        and 2a as received on 30 March 2007, and the drawings,
        sheets 1/7-7/7, and the description, pages 1 and 3-21
        as published. The appellant also invited the board to
        consider whether the incorrect reproduction of claim 1
        in the decision amounted to a substantial procedural
        violation based on which the appeal fee should be
        reimbursed, Rule 103(1)(a) EPC.

III.   In an annex to a summons to oral proceedings, the board
        informed the appellant of its preliminary opinion that
        the independent claims according to all pending
        requests lacked clarity, Article 84 EPC 1973. It also
        indicated that it was minded to remit the case to the
        examining division for further prosecution only if the
        clarity objection could be overcome and the assessment
        of novelty and inventive step could not be decided on
        the basis of common general knowledge alone.

IV.   In response to the summons, by letter dated
         7 February 2017, the appellant filed two new sets of
         claims: auxiliary requests 5 and 6.

V.   Oral proceedings were held as scheduled on 7 March
         2017, during which the appellant filed an amended set
         of claims 1-7, labelled "Auxiliary request 8", and
         withdrew all higher-ranking requests.

VI.   Independent claims 1 and 7 of the now sole request read
         as follows:

         "1. A method comprising:
            receiving instructions to create, on a technical
         computing client, a job object defining a job to be
         executed by at least one worker in a distributed
         computing environment that includes a plurality of
         different schedulers, a plurality of workers, and the
         technical computing client including an interface,
         wherein the job object includes a plurality of tasks
         created on the technical computing client (221);
            encoding the job object to a continuous byte stream
         by the technical computing client (221);
            receiving, at the interface, a request for a
         communication channel between the technical computing
         client and a scheduler of the different schedulers:
            wherein the interface (222) creates a scheduler
         object (320), wherein the scheduler object (320)
         provides a representation of the communication channel,
         and wherein the interface (222) establishes the
         communication channel by using the scheduler object;
            transferring the encoded job object via the
         communication channel to the scheduler with which the
         communication channel has been established;
            sending information relating to the job to the
         scheduler with which the communication channel has been

established, the information used by the schedulers to distribute the encoded job object to the plurality of workers;

transferring, from the scheduler (231), the encoded job object with designation information to the plurality of workers so that the plurality of workers (241; 251; 261) perform technical computing on the tasks and return results to the scheduler (231), wherein each worker receives information on the designation of one or more tasks in the job object that are to be executed on the worker (240) and wherein each worker (240) decodes the job object and restores the original job object,

wherein the plurality of workers (241; 251; 261) include at least software components of the technical computing client (221) that are needed to perform the technical computing on the tasks; and forwarding, from the scheduler (231), the results to the technical computing client (221).

7. A distributed computing system including:
devices to perform a method according to any one of claims 1 to 6."

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

Reasons for the Decision

Reimbursement of the appeal fee

1.   The appellant correctly observes that the decision reproduced claim 1 inaccurately in point IX of the

facts and submissions. Specifically, in each of S1-S4 the phrase "one or more instructions" was omitted compared with claim 1 as submitted on 24 July 2009.

1.1   However, the board finds it to be clear from the minutes of the oral proceedings before the examining division (see first paragraph) and the decision (see facts and submissions, points V and VIII) that the examining division considered and took a decision on the correct requests. A request containing claim 1 as reproduced in the decision was never filed.

1.2   Moreover, the clarity objections in the decision were to all three independent claims alike, i.e. to the computer-readable medium (claim 1), the method (claim 7) and the distributed computing system (claim 13). Claims 7 and 13, which are not reproduced in the decision, do not refer to "one or more instructions". Apart from the fact that, therefore, there is no doubt as to which version of claims 7 and 13 was considered in the decision, it is evident that the reasons in the decision do not depend on whether steps are claimed or "one or more instructions" to carry out steps. In other words, the omission in point IX is manifestly immaterial for the decision in substance.

1.3   Therefore, the board takes the view that the omission in point IX of the decision does not constitute a substantial procedural violation. The reimbursement of the appeal fee under Rule 103(1)(a) EPC is thus not possible.

The invention

2.   In general terms, the application relates to the
        distribution of jobs in a distributed computing
        environment, preferably to speed up the execution of
        complex MATLAB programs (see pages 1 and 2, last
        paragraphs).

2.1   The distributed computing environment considered in the
        application has the general form depicted in figure 3,
        comprising at least a client computer (no. 221), a
        "scheduler" (no. 230; also referred to as a "job" or
        "task manager", see page 6, lines 24-27) and several
        "workers" (no. 240, 250, 260). The application mentions
        in particular the need to be able to use "an arbitrary
        job manager provided by an arbitrary vendor" (page 3,
        lines 1-2) from which, if there are several, the user
        is to select one (see page 12, lines 17-24).

2.2   At the client computer a "job" is created, possibly
        comprising several "tasks" (see e.g. page 3,
        lines 12-14, and page 5, lines 24-26), and a request
        indicating (or implying) which scheduler is to mediate
        the transmission of the job to the workers (see e.g.
        page 12, lines 32-33). The client encodes the job for
        transmission to the scheduler (see, e.g. page 19,
        lines 1-3, and page 6, lines 12-13) via an interface,
        which establishes and manages the necessary
        communication using a "communication channel" and its
        software representation referred to as a "scheduler
        object" (see figure 3, no. 222; figure 4; and page 14,
        lines 26-27). Along with the job, additional
        information is transmitted to be used by the scheduler
        to distribute the job to the workers (see page 19,
        lines 23-29).

2.3   It is disclosed that the individual tasks can be
        encoded and transmitted to the scheduler separately
        (see paragraph bridging pages 19 and 20 and figure 3:
        Task 1 ... Task N), or that the job can be distributed
        as a whole (see esp. page 20, lines 30-31). The claimed
        invention is limited to the latter alternative.

2.4   If the job is transferred as a whole, the scheduler may
        send information "on the designation of [the] tasks in
        the job" too so that the individual workers know which
        tasks to process (see page 20, lines 31-33, and
        page 21, lines 4-5).

2.5   The application stresses the importance of encoding
        "job objects" in a "portable format" so that any
        scheduler "can handle the job or tasks regardless of
        the platform structure", or the "architecture", of the
        scheduler (see page 3, lines 14-16, and the paragraph
        bridging pages 18 and 19). As described above, it
        appears not to be necessary for the scheduler to access
        the encoded job object since all the information
        necessary for the scheduler to do its job is
        transferred separately from the job object. For the
        scheduler, that is, the format of the job object is
        immaterial. The workers however are supposed to support
        the same environment as the client and hence be able to
        process the tasks of the job, once decoded (e.g.
        MATLAB; see paragraph bridging pages 9 and 10, and
        page 21, paragraph 1).

2.6   As an example of a portable format, the application
        refers to the MAT-file format as used in the MATLAB
        environment, in particular for serialisation using the
        "save" and "load" commands (see page 6, lines 9-10;

lines 13-17, page 19, lines 1-3, and page 21,
lines 1-2).

Article 123(2) EPC

3.   The board is satisfied that the subject-matter of the
        amended claims was disclosed in the application as
        originally filed. A basis for the claim language is
        found in the passages just summarised, more
        specifically: as regards the encoding of the job object
        to a continuous byte stream, see page 19, lines 2-3; as
        regards the information on the job based on which the
        scheduler distributes it, see page 19, lines 23-28; and
        as regards the workers receiving designation
        information, decoding the job object and restoring the
        original job object, see page 20, line 27, to page 21,
        line 8.

Clarity, Article 84 EPC 1973

4.   The decision is based solely on lack of clarity.

4.1   *Architecture-independence*

        The then claims 1, 7 and 13 were objected to
        (reasons 1.1.1) because the feature that the "portable
        job format" was "independent of an architecture of the
        plurality of different schedulers" was impermissibly
        claimed "in terms of the result to be achieved".

        This objection has become moot vis-à-vis independent
        claims 1 and 7 because the language referring to the
        job format's *independence* of a number of undefined
        schedulers has been deleted. Moreover, the term
        "portable format" has been deleted from claims 1, 5
        and 7. That it is still used in claims 3, 4 and 6

without antecedent in the higher-ranking claims is a
marginal problem which remains to be corrected. The
skilled person reading these claims would, however,
understand that the term related to the format into
which the "job object" was "encoded" and that it was
"portable" in the sense that the job was passed over a
network from the client through the scheduler to the
workers for execution.

4.2   *Job distribution*

Similarly, it was argued (reasons 1.1.2 and 1.2.1, C2)
that the then claims 1, 6-7 and 13 were impermissibly
claimed in terms of the result to be achieved due to
the features "the information allowing the scheduler to
cause the job object in the portable format to be
distributed to the at least one worker" and "breaking
the job down into a plurality of portable format
files".

While it is true that neither the "information" is
defined in the claims nor the way in which the
scheduler uses it for the distribution of the job, this
is, in the board's view, a matter of permissible
breadth rather than of impermissible lack of clarity
(or result to be achieved). In passing, the board notes
that the application as a whole contains very little
detail about the distribution. The present claims no
longer refer to a "breaking [of] the jobs" into parts,
so this objection has become moot, too.

4.3   *Job object creation*

It was found that whether the claimed creation of the
job object was fully automated or required user

intervention was undefined (reasons 1.2.1, C1). This caused a lack of clarity because a method step "carried out by a human programmer [could] not be used to characterise the technical subject matter of" the claims "because the input data received from a user [did] not characterize the system receiving the user input".

The board agrees with the decision that the independent claims do not imply from where the "instructions to create a job object" are received, and hence do not exclude their being received from a human operator. The board does not, however, consider this to be a clarity problem. The claimed subject-matter is limited by this feature insofar as the "technical computing client" must be equipped to "receive instructions", irrespective of whether they are input by a human operator or not, and, in response, to "create a job object".

4.4   *Job object transfer*

The examining division also took issue (reasons 1.2.1, C2) with the features of the then claims 1, 7 and 13 according to which a job object was transferred "via a network of the distributed computing environment", along with "information allowing [...] the job object [...] to be distributed", because it was not defined (a) to which target system the job object was sent, (b) which scheduler was selected and how, and (c) how the "information" allowed the distribution of the job object.

It is now specified in the independent claims that the "request" received at the interface indicates which scheduler is selected and that, hence, the selection of the scheduler must have taken place before that. The claims do not contain a selection step and thus leave

open how or when the selection has been made. The claims now specify that the job object is sent as a whole and with "designation" information to the workers. It is not claimed how the scheduler produces the designation information - just as, in fact, the specifics of the designation appear to be missing from the application as a whole, too. Again, however, the board considers this not to cause a clarity problem but to be a matter of breadth.

5.   In the board's view, claim 1 now specifies an architecture for the distribution of a "job object" containing "tasks" from a "client" via a "scheduler" to a number of "workers" for execution. The transfer from the client to the scheduler is controlled by information which is undefined except from being separate from the "job object" itself; the transfer execution of the job object by the worker is controlled by "designation information". The format into which the job object is encoded is undefined but must be such that it allows the claimed transfer. This claim still is rather broad but, in the board's judgment, clear.

Remittal for further prosecution

6.   The only objection on which the refusal is based has thus been overcome.

6.1   At this point, Article 111(1) EPC gives the board discretion to decide whether to continue examination of the case or to remit it to the examining division for further prosecution.

6.2   The decision was based solely on lack of clarity and the present claims are considerably amended over the

ones subject to the decision, so that the inventive
step of the present claims has effectively not been
discussed before the examining division, and certainly
not exhaustively.

6.3   Moreover, the board notes that the new feature by which
the job is transferred to the worker as a whole and
with designation information was not in the claims as
originally filed. The board is therefore not in a
position to ascertain that the subject-matter of the
amended claims was covered by the search and would
therefore be unable to come to a positive conclusion on
inventive step in the sense of Article 56 EPC 1973,
even if it were to keep the case.

6.4   In view of these facts, the board exercises its
discretion by remitting the case to the examining
division for further prosecution.

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
        continuation of the examination proceedings based on
        the request of 7 March 2017.

The Registrar: The Chairman:

B. Atienza Vivancos   W. Sekretaruk

Decision electronically authenticated