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Datasheet for the decision
of 19 July 2022

Case Number: T 1561/19 - 3.5.03

Application Number: 13195861.3

Publication Number: 2881821

IPC: G05B23/02, G06F9/50

Language of the proceedings: EN

Title of invention:
Processor core array for characterizing behavior properties of
equipment, and method

Applicant:
Blue Yonder Group, Inc.

Headword:
Monitoring equipment behaviour II/BLUE YONDER

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
Clarity - all requests (no)
Inventive step - all requests (no): claimed device defined
merely as a "black box"

Decisions cited:

T 1560/19

Case Number: **T 1561/19 - 3.5.03**

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 19 July 2022

Appellant: (Applicant)	Blue Yonder Group, Inc. 15059 N. Scottsdale Road Scottsdale, AZ 85254 (US)
Representative:	Zahn, Matthias Peter Bittner und Partner Herrenwiesenweg 2 69207 Sandhausen (DE)
Decision under appeal:	Decision of the Examining Division of the European Patent Office posted on 20 December 2018 refusing European patent application No. 13195861.3 pursuant to Article 97(2) EPC.

Composition of the Board:

Chair	K. Bengi-Akyürek
Members:	K. Peirs
	N. Obrovski

Summary of Facts and Submissions

I.   The appeal is against the decision of the examining
        division refusing the present European patent
        application on the grounds of, *inter alia*, lack of
        inventive step (Article 56 EPC) and lack of clarity
        (Article 84 EPC) with respect of the claims of a main
        request, a first auxiliary request and third to seventh
        auxiliary requests. A second auxiliary request was not
        admitted into the proceedings under Rule 137(3) EPC.

II.   The appellant (applicant) was summoned to oral
        proceedings before the board. A communication was
        issued under Article 15(1) RPBA 2020 including the
        board's negative preliminary opinion concerning clarity
        (Article 84 EPC) and inventive step (Article 56 EPC).

III.   Oral proceedings before the board were held on
        19 July 2022 by videoconference (jointly with related
        case T 1560/19). At their end, the board announced its
        decision.

IV.   The appellant's final requests were that the decision
        under appeal be set aside and that a patent be granted
        on the basis of the claims of one of the **main request**
        and **first to seventh auxiliary requests** underlying the
        appealed decision.

V.   Claim 1 of the **main request** reads as follows (board's
        feature labelling; the board also underlined some of
        the differences vis-à-vis claim 1 of the main request
        in related case T 1560/19):

(a) "A <u>processor core array</u> (100, 700, 800) for
    characterizing behavior properties of equipment
    under observation (105),

(b) the <u>processor core array</u> (100, 700, 800) comprising
    a plurality of processor <u>cores</u>, <u>wherein one or more</u>
    <u>of the processor cores implement an operation</u>
    <u>module (705) to select processor cores (MC 1, MC 2,</u>
    <u>MC X) of the plurality of microprocessor cores,</u>

(c) wherein the selected processor cores are adapted to
    process input values ({a}, {b} ... {d}) to output
    values {b}, {c}, {d}, {e}) according to numerical
    transfer functions ({FI}, {FJ}, {FK}, {FL}, {FM}),
    with the numerical transfer functions <u>having a</u>
    <u>mapping functionality</u>, and with an input-to-output
    mapping specified by a configuration ({{C}}), <u>with</u>
    <u>the input-output mapping relating input values to</u>
    <u>output values, and with each input value</u>
    <u>corresponding to a single determined output value,</u>

(d) wherein the processor core array is adapted to load
    the configuration ({{C}}) prior to processing time,
    and

(e) wherein <u>the operation module (705) is adapted to</u>
    <u>select the microprocessor cores (MC 1, MC 2, MC X)</u>
    <u>from the plurality of microprocessors according to</u>
    <u>the availability of the cores and according to</u>
    <u>presence of equipment data values ({a}) from the</u>
    <u>equipment under observation (105)</u>".

VI.   Claim 1 of the **first auxiliary request** includes all the
        features of claim 1 of the main request, with the word
        "and" removed from the end of feature (d), and further
        includes, at the end, the following feature:

(f) ", and
    wherein the operation module (705) is adapted to
    assign data structures in memory to operate as

configuration buffers and to associate the data structures with the selected cores to receive the configuration ({{C}})".

VII.   Claim 1 of the **second auxiliary request** includes all the features of claim 1 of the first auxiliary request, with the word "and" removed at the beginning of feature (f) and further includes, at the end, the following features:

(g) ", and
    wherein the operation module (705) assigns a data structure to receive a configuration ({{C}} α) of a first processing context (α) and to receive a configuration ({{C}} β) of a second processing context (β), and
(h) wherein the processor core array (100, 700, 800) selects (191, 192) the cores to process data values accordingly during a time period that corresponds to the sampling rate".

VIII.   Claim 1 of the **third auxiliary request** includes all the features of claim 1 of the second auxiliary request, with the clause "during a time period that corresponds to the sampling rate" removed from feature (h), and further includes, at the end, the following feature:

(i) ", wherein input data values are being processed in the first processing context and subsequently being processed in the second processing context".

IX.   Claim 1 of the **fourth auxiliary request** includes all the features of claim 1 of the third auxiliary request and further includes, between features (c) and (d), the following feature:

(j) "wherein the numerical transfer functions have
    elements
        indicative of a function type (t~),
        indicative of input values (i~), and
        indicative of output values (o~),".

X.   Claim 1 of the fifth **auxiliary request** includes all the
        features of claim 1 of the fourth auxiliary request and
        further includes, between features (j) and (d), the
        following feature:

(k) "the elements specified by the configuration,".

XI.   Claim 1 of the **sixth auxiliary request** includes all the
        features of claim 1 of the fifth auxiliary request and
        further includes, between features (c) and (j), the
        following feature:

(l) "wherein the configuration ({{C}}) is obtained by
    pre-processing historic data (114) from a plurality
    of master equipment (104) in relation to the
    behavior properties of the equipment under
    observation (105),".

XII.   Lastly, claim 1 of the **seventh auxiliary request**
        includes all the features of claim 1 of the sixth
        auxiliary request but with feature (l) replaced with
        the following feature:

(m) "the configuration ({{C}}) being related to the
    behavior properties of the equipment under
    observation (105) so that some of the output
    values ({e}) represent the behavior properties of
    the equipment under observation (105),".

Reasons for the Decision

1.   *Technical background*

          The present application relates to monitoring a
          technical equipment's "behaviour". It does so in a way
          similar to the monitoring in case T 1560/19 (see
          Reasons 1 of the board's decision in that case), but
          implemented in the specific form of a "processor core
          array" having a plurality of microprocessor cores.

2.   *Main request: claim 1 - clarity*

2.1   Concerning clarity of claim 1 of the main request,
          similar considerations as mentioned in Reasons 2.1 to
          2.3 of the board's decision in case T 1560/19 apply.

2.2   In particular, regarding Reasons 2.1 and 2.2 of that
          decision, the board holds also for the present appeal
          case that

          -    the claims should essentially be read and
               interpreted by a skilled reader on their own
               merits, rather than with the aid of the description
               and drawings;

          -    the skilled reader to whom the present application
               is addressed is from the field of "*data processing
               for monitoring technical equipment*" (see also
               paragraph [001] of the present application as
               filed).

2.3   Moreover, similar to what was observed in Reasons 2.2
          of the board's decision in case T 1560/19, the clause
          "for characterising behaviour properties of equipment
          under observation" (emphasis added) of present

feature (a) is unclear for the reader skilled in the
technical field mentioned in point 2.2 above because it
is not apparent

- <u>how</u> the equipment's behaviour properties are
  characterised by the processor core array

and

- <u>by whom or by which entity</u> the equipment is under
  observation.

2.4   More specifically, the following unclarities are
        apparent:

2.4.1   **Feature (e)** is, apart from feature (a), the only
        feature in claim 1 that concerns the "equipment under
        observation". It requires merely to select the
        "microprocessor cores" of feature (b) based on whether
        equipment data values from the equipment under
        observation are present (i.e. available). It would
        however be unclear to the skilled reader whether the
        claimed "processor core array" can, in fact,
        <u>characterise</u> the "equipment's behaviour properties",
        i.e. describe the distinctive nature of these
        properties, particularly in view of the fact that, as
        was highlighted already in Reasons 2.3.1 of the board's
        decision in case T 1560/19, the equipment's behaviour
        could relate to a behaviour over a certain time span or
        to a behaviour in the *past*, the *present* or even the
        future, which are all to be characterised differently
        in order to describe their distinctive nature. Claim 1
        is entirely silent in this regard.

2.4.2   Moreover, the claimed "processor core array" does not
        comprise any features that would enable an

"observation" as required by feature (a). In
particular, it does not indicate how to characterise
behaviour properties of the equipment which cannot be
directly observed, for instance, when a camera is used
to observe the equipment comprising a protective
casing, the (internal) behaviour of the equipment being
discernible only when the protective casing is removed.
It is emphasised here that the "input" of the
"input-to-output mapping" of feature (c) is completely
arbitrary. The same applies to the "configuration"
according to features (c) and (d).

2.5   In addition, features (b) and (e) suffer from an
        inconsistent terminology, referring to "a plurality of
        processor cores" and "the plurality of microprocessor
        cores" in feature (b) as well as to "the microprocessor
        cores", "the plurality of microprocessors" and "the
        cores" in feature (e).

2.6   As a consequence, claim 1 of the main request does not
        fulfil the clarity requirement of Article 84 EPC.

3.   *Main request: claim 1 – inventive step*

3.1   A similar reasoning as provided in Reasons 2.4 of the
        board's decision in case T 1560/19 applies here.

3.2   As regards the presence of a credible technical effect,
        the appellant emphasised during the hearing before the
        board that the claimed "processor core array" comprises
        multiple microprocessor cores. This implied, in the
        appellant's view, that a selection must be made of
        which microprocessor core will perform which
        calculations. The appellant further explained that the
        operation module of features (b) and (e) was
        necessarily active at the same time when the

microprocessor cores process the data. In the
appellant's opinion, the expression "according to" of
this latter feature implied that it was checked which
microprocessor cores and which data values were
available. The appellant also emphasised that the term
"behaviour" implied that the equipment was not a
"museum piece" but was necessarily doing something. The
appellant concluded that, as a result, the equipment
would unavoidably make the data values according to
feature (e) available. In the appellant's view, the
skilled reader would realise that this selection was to
be done "on the fly" with the aim of "saving energy".

The appellant's line of argument does not imply,
however, any technical effect that would be credibly
brought about by features (a) to (e). The board agrees
that the "plurality of microprocessor cores" of
feature (b) requires the presence of a scheduler, i.e.
an "operation module" according to features (b) and
(e), to distribute incoming tasks over the
microprocessor cores. However, features (a) to (e) are
silent about <u>how</u> the operation module actually performs
this distribution. In particular, they are silent about
any selection "on the fly". The same applies to the aim
of "saving energy". The board can therefore only come
to the same conclusion as in Reasons 2.4 of the board's
decision in case T 1560/19, namely that the claimed
processor core array acts as a "black box" using
abstract mathematical method steps, without achieving
any credible technical effect.

3.3   Moreover, regarding the formulation of the objective
        technical problem, the appellant started from the
        assumption that the problem of "re-recognising certain
        signal patterns" as addressed in Reasons 2.4 of the
        board's decision in case T 1560/19 was solved. The

appellant submitted that, with this underlying
assumption, the skilled reader would realise that the
microprocessor cores must be selected appropriately,
namely according to the availability of a particular
microprocessor core and of relevant data values. It was
important, in the appellant's view, to appreciate that
this selection must be done with the knowledge of the
skilled reader at the present application's date of
filing. The appellant concluded that the skilled reader
would then realise that the objective technical problem
to be solved was "how to avoid spending too many of the
microprocessor cores".

However, features (a) to (e) leave the skilled reader
in the dark on how to select the microprocessor cores
"appropriately". Such an appropriate selection must
evidently take into account the conditions that prevail
in the claimed "processor core array" at the time of
selection. Such conditions are not mentioned in
features (a) to (e). The board notes in particular here
that these features are, for instance, silent on the
point in time and the frequency at which the
availability of the microprocessor cores and of the
data values according to feature (e) are verified.

3.4   Hence, even if claim 1 of the main request were clear,
        no inventive step could be acknowledged (Article 56
        EPC).

4.   *First to seventh auxiliary requests: claim 1 – clarity
        and inventive step*

4.1   **Features (f) to (m)** do not resolve any of the clarity
        deficiencies mentioned for claim 1 of the main request
        in point 2 above. In particular, the following is

noted.

4.1.1   Regarding **feature (h),** the appellant submitted during
         the hearing before the board that the sampling rate was
         linked to the timing of the data values' availability.
         The appellant noted that the skilled reader would
         immediately understand that the term "equipment" was
         missing in front of "data values" in feature (h), such
         that it was readily apparent that the same data values
         as those in feature (e) were meant.

         The board holds that none of features (a) to (h)
         provide any indication supporting the appellant's
         interpretation of the terms "sampling rate" and "data
         values" used in feature (h). This means that, in
         particular, the data values of feature (h) can very
         well differ from those of feature (e).

4.1.2   Furthermore, the board acknowledges that **feature (l)**
         may provide a link between the "configuration" of
         features (c), (d) and (k) and "behaviour properties of
         the equipment under observation" of **feature (a).**
         However, it would not be apparent for the skilled
         reader how a particular configuration would actually
         have been obtained: the skilled reader would not be
         able to verify whether such a configuration has in fact
         been obtained by pre-processing historic data from a
         plurality of master equipments.

4.1.3   Moreover, **feature (m)** merely requires the behaviour
         properties of the equipment under observation to be
         related to the configuration of **features (c), (d) and
         (k).** Similar to what has been set out in Reasons 2.3.1
         of the board's decision in case T 1560/19, no details
         regarding the relationship between the equipment's
         "behaviour properties" and the "configuration" are

provided in feature (m), other than the vague
indication that <u>some</u> of the output values obtained via
the configuration <u>represent</u> the behaviour properties.
Due to the breadth of the terms referred to in
feature (m), the skilled reader would consequently be
in doubt as to whether (some of) the "output values" of
feature (m) can, in fact, <u>characterise</u> the equipment's
behaviour properties, i.e. describe the distinctive
nature of these properties.

4.1.4   Regarding **feature (m)**, the appellant emphasised that
the term "some" simply related to a subset.

Nonetheless, the board holds that this term introduces
a further lack of clarity because the skilled reader is
not informed, by the wording of claim 1, about what
happens with the other output values. Moreover, similar
to what has been addressed in Reasons 2.3.1 of the
board's decision in case T 1560/19, the skilled reader
would not know how to achieve the result that "some of
the output values represent the behaviour properties of
the equipment under observation".

4.2   Moreover, **features (f) to (m)**, as far as they can be
understood, do not contribute to an inventive step,
given that they constitute obvious implementation
details to the skilled person.

4.3   Hence, the first to seventh auxiliary requests are also
not allowable under Articles 84 and 56 EPC.

Order

For these reasons it is decided that:

    The appeal is dismissed.

The Registrar: The Chair:

B. Brückner   K. Bengi-Akyürek

Decision electronically authenticated