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**Datasheet for the decision
of 3 February 2023**

Case Number: T 1910/20 - 3.5.05

Application Number: 11794044.5

Publication Number: 2649544

IPC: G06F19/00

Language of the proceedings: EN

Title of invention:
SYSTEMS AND METHODS FOR AUTOMATICALLY DISPLAYING PATTERNS IN
BIOLOGICAL MONITORING DATA

Applicants:
Roche Diabetes Care GmbH
F. Hoffmann-La Roche AG

Headword:
Displaying cluster centres/ROCHE

Relevant legal provisions:
EPC Art. 56
RPBA 2020 Art. 20(2)

Keyword:
Inventive step - (no)

Decisions cited:
T 0115/85, T 0362/90, T 1802/13, T 0336/14, T 1785/14,
T 1091/17

Beschwerdekammern

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Case Number: T 1910/20 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 3 February 2023

Appellant: (Applicant 1)	Roche Diabetes Care GmbH Sandhofer Strasse 116 68305 Mannheim (DE)
Appellant: (Applicant 2)	F. Hoffmann-La Roche AG Grenzacherstrasse 124 4070 Basel (CH)
Representative:	Bittner, Thomas L. Boehmert & Boehmert Anwaltspartnerschaft mbB Pettenkoferstrasse 22 80336 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 15 June 2020 refusing European patent application No. 11794044.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair   A. Ritzka
Members: E. Konak
              E. Mille

Summary of Facts and Submissions

I.   The appeal is against the examining division's decision
        to refuse the application on the grounds that the main
        request and auxiliary requests 1 to 3 did not meet the
        requirements of Article 56 EPC with regard to the
        following document:

        D1: WO 2010/075350 A1

II.   In their statement setting out the grounds of appeal,
        the appellants requested that the decision be set aside
        and that a patent be granted on the basis of one of the
        requests on which the contested decision was based.
        They requested oral proceedings as an auxiliary
        measure.

III.   The board summoned the appellants to oral proceedings.
        In its preliminary opinion pursuant to Article 15(1)
        RPBA, the board raised objections under Article 56 EPC.

IV.   Oral proceedings were held before the board.

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

        "A collection system for automatically displaying
        patterns in glucose data, the collection system
        comprising:
        - one or more processors;
        - an electronic display communicatively coupled to the
        one or more processors; and
        - machine readable instructions that are executed by
        the one or more processors, wherein the machine
        readable instructions cause the one or more processors
        to execute an algorithm comprising:

- receiving a glucose data signal indicative of
ambulatory glucose levels sampled over time,
wherein the glucose data signal is associated with
a time index indicative of a point in time, a date,
or both that the glucose data signal was sampled;
and
- dividing the glucose data signal into segments of
interest according to the time index, wherein the
segments of interest are each a time window of
data;

characterized in that said algorithm is a pattern
enhancement algorithm for enhancing patterns that exist
within the glucose data signal, the pattern enhancement
algorithm further comprising:

- extracting, automatically, a set of features
according to a mathematical algorithm from each of the
segments of interest, thereby, automatically
transforming each of the segments of interest into the
set of features that is a reduced representation of the
segments of interest;

- determining, automatically, a distance metric between
each of the segments of interest based at least in part
upon the set of features of the segments of interest by
applying a function for determining the distance metric
to the set of features, wherein the distance metric is
indicating a degree of similarity between each of the
segments of interest;

- clustering, automatically, the segments of interest
into a number of groups of clustered segments based at
least in part upon the distance metric, according to a
clustering algorithm, thereby, grouping similar
segments of interest in each of the clustered segments;

- calculating a cluster center for each of the groups
of clustered segments, wherein the cluster center is
based upon a mean of one of the groups of clustered
segments; and

- presenting, automatically, the cluster centers on the electronic display."

Claim 1 of auxiliary request 1 differs from claim 1 of the main request as follows (with the additions underlined):

"[...]
- extracting, automatically, a set of features according to a mathematical algorithm from each of the segments of interest, thereby, automatically transforming each of the segments of interest into the set of features that is a reduced representation of the segments of interest, wherein the mathematical algorithm comprises a Principal Component Analysis (PCA), a Kernel PCA, a wavelet analysis, a frequency analysis, or a combination thereof; in particular, wherein the clustering algorithm comprises an optimizer;
- determining, automatically, a distance metric between each of the segments of interest based at least in part upon the set of features of the segments of interest by applying a function for determining the distance metric to the set of features, wherein the distance metric is indicating a degree of similarity between each of the segments of interest, wherein the function for determining the distance metric is based upon a sum of squared distance, a sum of absolute distance, a Mahalanobis distance, a Manhattan distance, a maximum norm, or a combination thereof;
- clustering, automatically, the segments of interest into a number of groups of clustered segments based at least in part upon the distance metric, according to a clustering algorithm, thereby, grouping similar segments of interest in each of the clustered segments, wherein the clustering algorithm comprises a K-means

algorithm, a Hierarchical clustering algorithm, a
Gaussian mixture modeling algorithm, a Normalized Cuts
algorithm, or a combination thereof;
[...]"

Claim 1 of auxiliary request 2 differs from claim 1 of
auxiliary request 1 as follows (with the deletions
~~struck-through~~):

"[...]
- extracting, automatically, a set of features
according to a mathematical algorithm from each of the
segments of interest, thereby, automatically
transforming each of the segments of interest into the
set of features that is a reduced representation of the
segments of interest, wherein the mathematical
algorithm comprises a Principal Component Analysis
(PCA), a Kernel PCA, a wavelet analysis, a frequency
analysis, or a combination thereof; ~~in particular,~~
~~wherein the clustering algorithm comprises an~~
~~optimizer;~~
- determining, automatically, a distance metric between
each of the segments of interest based ~~at least in part~~
upon the set of features of the segments of interest by
applying a function for determining the distance metric
to the set of features, wherein the distance metric is
indicating a degree of similarity between each of the
segments of interest, wherein the function for
determining the distance metric is based upon a sum of
squared distance, a sum of absolute distance, a
Mahalanobis distance, a Manhattan distance, a maximum
norm, or a combination thereof;
- clustering, automatically, the segments of interest
into a number of groups of clustered segments based ~~at~~
~~least in part~~ upon the distance metric, according to a
clustering algorithm, thereby, grouping similar

segments of interest in each of the clustered segments,
wherein the clustering algorithm comprises a K-means
algorithm, a Hierarchical clustering algorithm, a
Gaussian mixture modeling algorithm, a Normalized Cuts
algorithm, or a combination thereof;
[...]"

Claim 1 of auxiliary request 3 differs from claim 1 of
auxiliary request 2 as follows (with the additions
underlined):

"[...]
- presenting, automatically, the cluster centers on the
electronic display, comprising presenting at least one
of the following
    - summary statistics calculated for each group of
    clustered segments including one of the following:
    the mean, median, standard deviation, mean absolute
    difference, percentage of time in hyperglycemia,
    percentage of time within a target range,
    percentage of time below a threshold, and
    percentage of time above a specific threshold;
    - regions of importance selected from the
    following: hyperglycemia, hypoglycemia, and glucose
    target ranges; and
    - contextual data associated with the clustered
    data segments selected from the following: meal
    tags, carbohydrate intake, and insulin injections."

Reasons for the Decision

1.   The contested decision held that the features in the
        characterising portion of claim 1 of each of the
        requests indicating the details of the pattern
        enhancement algorithm were distinguishing features with

regard to D1. The appellants did not contest the
distinguishing features but did dispute the examining
division's conclusion that the distinguishing features
did not contribute to the technical character of the
invention. In particular, the examining division had
held that the purpose of the distinguishing features
was a presentation of information, which did not
credibly assist a user in performing a technical task
by means of a continued and guided human-machine
interaction process (the requirement in T 336/14 and T
1802/13).

In their statement setting out the grounds of appeal,
the appellants argued that the technical effect of the
distinguishing features was enhancing patterns in
measured glucose data which may otherwise not be
recognised or may be overlooked, namely making said
patterns visible or recognisable. They argued that in
the case in hand the presented information, in
particular the cluster centres, contributed to the
technical character of the invention because the
presented clusters would help an experienced and
skilled doctor to better understand the measurement
data and thus assist them in building a more
appropriate diabetes therapy plan.

The board is not convinced by the appellants'
arguments. Building a therapy plan, which should not be
confused with practising a method of therapy on the
human body, is a purely intellectual exercise, not a
technical task. It is analogous to the purely
intellectual deductive decision phase in diagnosis (see
T 1091/17, point 1.8 of the reasons). For want of any
technical task, the argument that the information
presented in this case allegedly assists a user in

performing a technical task can be dismissed straight
away.

2.   At the oral proceedings, the appellants argued that the
      pattern enhancement algorithm as indicated in the
      distinguishing features was above all a mathematical
      method which contributed to the technical character of
      the invention, not only by virtue of the resultant
      presentation of information but also on account of the
      derivation of a patient's physiological state. They
      referred to the Guidelines for Examination in the
      European Patent Office, G-II, 3.3, which states the
      following: "*If steps of a mathematical method are used
      to derive or predict the physical state of an existing
      real object from measurements of physical properties,
      as in the case of indirect measurements, those steps
      make a technical contribution regardless of what use is
      made of the results.*" The appellants argued that a
      patient was also an existing real object and their
      physiological state, in terms of patterns in their
      blood glucose data, was a physical state. They further
      referred to T 1785/14 as support for their argument.

      The appellants' argument seemed to build on a
      misleading blanket statement they had cited from the
      Guidelines. When the board reminded the appellants that
      the Guidelines are not binding on the boards (see Case
      Law of the Boards of Appeal, 10th edition, July 2022,
      III.W.1), the appellants indicated that they had cited
      this statement as it also represented their own opinion
      on the contribution of mathematical method steps to the
      technical character of the invention. For this reason,
      and also in view of Article 20(2) RPBA, the board deems
      it necessary to explain why this statement is
      erroneous. In the preceding sentence of the Guidelines,
      referring to relevant case law, it is correctly stated

that "[d]*efining the nature of the data input to a mathematical method does not necessarily imply that the mathematical method contributes to the technical character of the invention*". In particular, to contribute to technical character, it is not sufficient that the quantities processed by a mathematical method represent physical parameters. As arguably all physical parameters represent a physical state of an existing real object, it follows that the subsequent sentence in the Guidelines, at least at its level of generality ("*those steps make a technical contribution regardless of what use is made of the results*"), is wrong.

Moreover, it cannot be derived from T 1785/14 (to which the appellants referred) that defining the input to a mathematical method as physiological parameters would suffice to contribute to the technical character of the invention. The board in that case found that the distinguishing features solved the technical problem of allowing for better accuracy when determining the sampling time for an individual animal (see T 1785/14, point 3.1.2). That is not comparable with the case in hand, in which the appellants have been unable to demonstrate any technical effect of the presentation of cluster centres produced by the mathematical steps of claim 1 of any of the requests.

3.   The appellants also referred to two early decisions of the boards of appeal on the possible technical contribution of the presentation of information, namely T 115/85 and T 362/90. These decisions have been discussed in detail in subsequent case law. As summarised in T 336/14 (see point 1.2.3 of the reasons), for any such contribution, it is relevant to determine whether the presented information constitutes an operation state, a condition or an event internal to

the underlying technical system. In the case in hand,
the presented cluster centres are not an internal state
of the underlying technical system, namely the
collection system. Instead, they arguably relate to the
internal state of a patient, as the appellants
themselves asserted (see point 2. above). Therefore,
these decisions have no relevance to the case in hand.

4.   Consequently, claim 1 does not involve an inventive
        step (Article 56 EPC) in any of the requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chair:

K. Götz-Wein   A. Ritzka

Decision electronically authenticated