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Datasheet for the decision of 17 September 2021

Case Number: T 0150/19 - 3.2.04

Application Number: 10849407.1

Publication Number: 2556862

IPC: A63B31/00, G09B19/00

Language of the proceedings: EN

Title of invention:
SWIMMER POSTURE ADJUSTMENT METHOD AND SWIMMER INFORMATION MEASUREMENT DEVICE USING SAME

Applicant:
Wakayoshi, Koji
Yamamoto, Tomizo

Headword:

Relevant legal provisions:
EPC Art. 52(1), 56

Keyword:
Patentable invention - (yes)
Inventive step

Decisions cited:

Catchword:

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Case Number: T 0150/19 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 17 September 2021

Appellant: (Applicant 1)	Wakayoshi, Koji 8-20 Kinoshita-cho Otsu-shi, Shiga 520-0812 (JP)
Appellant: (Applicant 2)	Yamamoto, Tomizo 13-11, Nakagawa, 5-chome, Ikuno-ku Osaka-Shi, Osaka 544-0005 (JP)
Representative:	Abel & Imray Westpoint Building James Street West Bath BA1 2DA (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 20 August 2018 refusing European patent application No. 10849407.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Martin Gonzalez
Members:	S. Hillebrand
	C. Heath

Summary of Facts and Submissions

I. The appeal was filed by the appellant (applicant) against the decision of the examining division to refuse the patent application in suit.

II. The examining division decided that the subject-matter of the independent claims of all requests before it did not involve an inventive step in the light of

D1 Scott P Mclean ET AL: "Buoyancy, Gender, and Swimming Performance",
JOURNAL OF APPLIED BIOMECHANICS, 31 December 2000 (2000-12-31), pages 248-263, XP055210739.

D3 MCLEAN, SCOTT P. ET AL.: "Sex differences in the centre of buoyancy location of competitive swimmers", JOURNAL OF SPORTS SCIENCES, vol. 16, no. 4, 4 June 1998 (1998-06-04), pages 373-383, XP008162378.

III. In preparation for oral proceedings the Board issued a communication, dated 3 December 2020, setting out its provisional opinion on the relevant issues.

With letter of 7 September 2021 the appellant filed a new main request with an amended set of claims in reply to the comments made by the rapporteur on behalf of the Board in a telephone conversation on 7 September 2021 and in the written communication of 3 December 2020.

In the light of the new main request, oral proceedings were cancelled by the Board.

IV. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the main request filed on 7 September 2021, alternatively on the basis of auxiliary request 1 filed on 19 April 2018, auxiliary request 2, filed on 15 June 2018, auxiliary requests 3, 4 filed with the statement of grounds on 18 December 2018, or auxiliary requests 5-8 filed with letter of 20 August 2021.

V. The independent claims of the main request read as follows:

"**1.** A swimmer posture adjustment method, wherein: the center of mass location (X_1) of a swimmer, and the center of buoyancy location (X_2) and buoyant force (B) of the swimmer maintaining a streamlined gliding posture in a downward-facing floating state in the water are obtained as measured swimmer information by measurement of the swimmer; and a buoyant and detachable balancer is attached to the body of the swimmer on the basis of the measured swimmer information, to adjust the difference between the center of mass location (X_1) and the center of buoyancy location (X_2) of the swimmer."

"**8.** A swimmer information measurement device for use in the swimmer posture adjustment method according to claim 1, claim 2 or claim 4, comprising:

an upper half body supporting section and a lower half body supporting section which include therebetween the center of buoyancy and the center of mass of the swimmer maintaining the streamlined gliding posture in the downward-facing floating state in the water and respectively support, at two points, the upper half body and the lower half body of the swimmer; an upper half body load sensor which measures a load (F1) acting

at the upper half body supporting section; a lower half body load sensor which measures a load (F2) acting at the lower half body supporting section; residual air amount measurement means which measures a residual air amount (Vc) of the swimmer at the time of measurement of the loads; a storage section which stores the upper half body load (F1), the lower half body load (F2), the distance (X_0) between both the load measurement points, the residual air amount (Vc), and the previously measured weight (W) and calculated center of mass location (X_1) of the swimmer; arithmetic processing means which calculates the swimmer information including the buoyant force (B) and the center of buoyancy location (X_2) on the basis of the upper half body load (F1), the lower half body load (F2), the distance (X_0) between both the load measurement points, the residual air amount (Vc), which are stored in the storage section; and output means which outputs the swimmer information calculated by the arithmetic operation means,

wherein: the arithmetic processing means can perform processing in which a regression expression is created by setting, as an explanatory variable, each of a set of a plurality of the upper half body loads (F1) and a set of a plurality of the lower half body loads (F2) that are stored in the storage section, and by setting, as an objective variable, the residual air amounts (Vc) stored in the storage section;

the following relational expression (4) stored beforehand in the storage section is called, and then the buoyant force (B) is calculated by substituting these created regression expressions into relational expression (4); and

the following relational expression (5) stored beforehand in the storage section is called, and the center of buoyancy location (X_2) is calculated by

substituting the regression expressions of the buoyant force (B) and the upper half body load (F1) into the relational expression (5)

$B = W + Fl + F2$ ... (4)

$X_2 \cdot B + X_1 \cdot (-W) + X_0 \cdot (-F1) = 0$ ... (5)".

Reasons for the Decision

1. The appeal is admissible

2. Background

The application relates to a method for adjusting the posture of a swimmer so that the center of mass of the swimmer body and the center of buoyancy are close to each other. In this way, the swimmer can easily maintain the horizontal posture in water. The water resistance is accordingly reduced, see application paragraphs [0001]-[0003]. To this end, the swimmer's center of mass and center of buoyancy in streamlined posture are measured. The difference between the center of mass and of buoyancy is adjusted by attaching a buoyant and detachable balancer to the body of the swimmer on the basis of the measured swimmer information, see claim 1 and paragraphs [0010]-[0011].

Independent claim 8 is directed to a measurement device for measuring the buoyant force and the center of buoyancy. The swimmer is submerged in water in streamlined position and supported at two points, at upper body and lower body positions (3, 4), see figure 1. The forces at those points are measured, as is also the residual air amount in the swimmer's lungs. The body mass and center of mass from a previous measure is also introduced to the system. With these data and the supporting forces locations, the buoyant force and the

center of buoyancy are calculated. Also the correlation of the buoyancy parameters with respect to the lung's residual air amount can be calculated, see claim 8 and paragraphs [0016]-[0019].

3. Amendments

Claim 1 is as originally filed, amended to clarify that the swimmer informations are measured values and that the attachment of the detachable balancer is to adjust the difference between center of mass and center of buoyancy locations. Basis for these amendments can be found respectively in originally filed paragraphs [0009] and [0010].

Independent claim 8 is as originally filed amended to specify that the measurement device is suitable for use in a method according to claim 1. Basis for the amendment can be found in original paragraph [0017].

The Board is satisfied that the claims according to the main request meet the requirements of Article 123(2) EPC.

4. Main request - Claim 1 - Technical character and inventive step.

4.1 Technical character of the invention

The requirement of technical character is separate to and independent of the remaining requirements of Article 52(1) EPC, in particular novelty and inventive step. Technical character results either from the physical features of an entity or (for a method) from the use of technical means, see Case Law of the Boards of Appeal, 9th edition 2019 (CLBA) I.D.9.1.1.

In the present case, the method for adjusting the posture of a swimmer uses technical means, namely a buoyant and detachable balancer attached to the body of the swimmer. The claimed method has therefore technical character.

4.2 Inventive step

4.3 The method for artificial manipulation of buoyancy while swimming using plastic tubes filled with air or wet suits, as described on page 249, first full paragraph of D1, is regarded by the Board as a suitable starting point for the assessment of inventive step. This method shares a similar purpose and effect to that of the claimed invention, namely to artificially manipulate the swimmer's buoyancy. It also uses buoyant detachable balancers.

4.4 The claimed method differs from the one described on page 249 of D1 in that the center of mass location of a swimmer, the center of buoyancy location and buoyant force of the swimmer in streamlined gliding posture are measured; and in that the buoyant balancer is attached to the body of the swimmer on the basis of the swimmer information to thereby adjust the difference between center of mass and center of buoyancy locations.

According to Boards of Appeal case law, when assessing novelty and inventive step, all those features which contribute to the technical character of the invention are taken into account. These features also include those, which in isolation may be non-technical, but in the context of the invention contribute to producing a technical effect serving a technical purpose, see Case Law of the Boards of Appeal, 9th Edition 2019 (CLBA)

I.C.5.2.8 and I.D.9.1.2. In the present case, obtaining the measured swimmers information implies measurement of swimmer's parameters and thus the use of technical means. Moreover, the use of the data for adjusting the balancer to the particular swimmer achieves a physical effect that is technical in nature, namely a more precise swimmer's balancing. The differentiating features contribute therefore to the technical character of the invention.

The associated technical problem can be formulated as how to improve the buoyancy manipulation method's accuracy.

4.5 The feature of using measured swimmer's parameters for adjusting the swimmer's buoyant balancer is neither disclosed nor suggested by the available prior art. D1 and D3 are scientific papers that report statistical exploitation of collected swimmers' data measurements. However, they do not discuss individual swimmer posture adjustment using these data and thus also not the use of measured individual data for adjustment of a buoyant balancer to the swimmer, as claimed. They would therefore not lead the skilled person to the use of such measured data in the known method for artificial manipulation of buoyancy as a matter of obviousness.

4.6 Also starting from the other method described on page 251 of D1, third paragraph and figure 1 of D1, as in the impugned decision, sections 1.6-1.8, would lead to the same conclusion.

The above method is a measurement method, not a swimmer posture adjustment method. There is no disclosure or suggestion of any associated detachable buoyant balancer. D1 describes on page 251 a method where a

body is supported using two tethers at the chest and the ankles. Forces at the tethers are measured to calculate the relevant buoyant parameters. The tethers thus, while measuring, apply a pulling force on the swimmer.

The Examining Division held that the skilled person would replace the tether by a detachable buoyant balancer, since it sees them as equivalent means known to the skilled person for balancing in water, see sections 1.8-1.9. The Board is not convinced by this argument. The tether in the described method is not simply a balancer. It is part of a measuring instrument. Without the tethers, the system of figure 1 of D1 would not be able to take any measurements. The skilled person confronted with improving a known measurement method would not as a matter of obviousness abandon taking measurements.

4.7 The Board concludes that claim 1 of the main request involves an inventive step as required by Article 52(1) with Article 56 EPC.

5. Main request - Independent claim 8 - Inventive step.

5.1 Document D1 describes a swimmer information measurement device for use in the method of claim 1 of the present application. The testing and measurement device described on page 251 discloses two load cells and tethers that anticipate the upper half body and lower half body supporting sections and sensors in the sense of independent claim 8, see also D1, figure 1. It also discloses the corresponding relational expressions to calculate the buoyant force and center of buoyancy, see formulae (1)-(4) of D1.

The claimed device differs from the one disclosed in D1 in the provision of residual air amount measurement means which measures a residual air amount of the swimmer at the time of measurement of the loads. This measuring means allows the measurement and correlation of the buoyancy parameters for all different swimmer's inhalation states. The associated technical problem can thus be formulated as how to enhance the accuracy of the measurement means.

The further implementation of means to carry out measurements of residual air amount at the time of measurement of the cell loads in a test machine of the type of D1 is not suggested by the available prior art documents. D1 describes on page 251, first paragraph that "[R]esidual lung volume was *estimated* using regression equations developed by Goldman and Becklace (1959)". Whether and how this *estimated* lung volume is exploited for the measurement of the buoyant force and its point of application is not described. The description of the device to measure the buoyant force and point of application begins further below, in the second paragraph of page 251. The test measurements are carried out "with the subject at maximal inhalation", see page 251, paragraph 3. This emphasises the importance of reproducing constant measuring conditions, i.e. always at maximal inhalation. There is however no teaching in D1 suggesting that simultaneous measurement of residual air amount might be of interest that would lead the skilled person to consider the implementation of a further measurement means in the device of D1 as a matter of obviousness.

5.2 The Board thus concludes that claim 8 of the main request also involves an inventive step in the sense of Article 56 EPC.

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 with the order to grant a patent with the following claims and a description to be adapted thereto:**

   Claims:
   No. 1-8 filed with letter of 7 September 2021.

The Registrar: The Chairman:

G. Magouliotis G. Martin Gonzalez

Decision electronically authenticated