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D E C I S I O N
of 28 June 1999

Case Number: T 1220/97 - 3.4.2

Application Number: 89309050.6

Publication Number: 0358496

IPC: G01M 1/02

Language of the proceedings: EN

Title of invention:
Wheel measuring apparatus and wheel balancer incorporating same

Patentee:
Interbalco AG

Opponent:
Carl Schenck AG
Hofmann Werkstatt-Technik GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes after (amendment)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1220/97 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 28 June 1999

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 29 October 1997 revoking European patent No. 0 358 496 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: E. Turrini
Members: M. A. Rayner
B. J. Schachenmann

Summary of Facts and Submissions

I. Notice of appeal was filed against the decision of the opposition division revoking European patent No. 358 496 (application No. 89 309 050.6). The appellant is proprietor of the patent.

II. Two oppositions were filed, one of which was subsequently withdrawn, referring inter alia, to the following document as prior art in support thereof:

EH5 - IT-A-1 215 026

III. In the statement setting out the grounds of appeal, oral proceedings were requested by the appellant should the board of appeal not be able to comply with its requests. In the reply to this statement and its annexes, the respondent (= opponent I, the remaining opponent), requested dismissal of the appeal in its entirety. In the annex to the summons to attend oral proceedings, the appeal board expressed its provisional view that having regard to the Italian patent law, document EH5 is part of the prior art.

IV. At the oral proceedings, which were not attended by the respondent, the appellant presented as main and only request a set of claims as basis for maintenance of the patent, corresponding in substance to a linguistically clarified version of a set of claims set out as an auxiliary request in annex 2 to the statement setting out the grounds of appeal. Independent apparatus claim 1 and method claim 12 are worded as follows:

"1. Wheel balancing apparatus of the type comprising a

housing (4), a receiving means (5,8) comprising a wheel support shaft (5) rotatably mounted in the housing (4) for receiving a wheel (9) to be balanced, and defining the rotational axis (7) of the wheel (9), a computing means (60) for determining the imbalance of the wheel (9), and a sensing means (26,27) for detecting the wheel (9) and a balance weight receiving location (15), the sensing means (26,27) being mounted on a mounting means (17), the mounting means (17) being movable relative to the housing (4), wherein the sensing means (26,27) is adapted to transmit and receive a signal for detecting the wheel (9) and the balance weight receiving location (15), the sensing means (26,27) being mounted on the mounting means (17) for transmitting the signal towards a radial side face (33,34) of the wheel (9) from a predetermined position (26,27,53,54) relative to the mounting means (17), and the mounting means (17) is constrained to move in a predetermined path relative to the housing (4) so that on movement of the mounting means (17) relative to the housing (4) the signal of the sensing means (26,27) moves over portion of the radial side face (33,34) of the wheel (9), a detecting means (28) for detecting the position of the mounting means (17) relative to the housing (4) is provided, the computing means comprises a storing means for storing output signals received from the sensing means (26,27) which correspond to distances of the radial side face (33,34) of the wheel (9) from a reference plane (18) which extends transversely of the rotational axis (7) against corresponding output signals received from the detecting means

(28) at predetermined intervals on movement of the mounting means (17), the computing means (60) comprises a means for storing reference parameters of reference wheels, and a means for computing corresponding parameters of the wheel (9) from the output signals from the sensing means (26,27) and the detecting means (28) stored in the storing means, and a means for comparing the computed parameters of the wheel (9) with the reference parameters of the reference wheels for determining the type of wheel the wheel (9) is and for determining from the reference parameters the radial distance (R_1) of the balance weight receiving location (15) from the rotational axis (7), and the computing means computing from the output signals received from the sensing means and stored in the storing means the distance (x_1,y_1) of the balance weight receiving location (15) from the reference plane (18), the computed values of the radial distance (R_1) and the distance (x_1,y_1) from the reference plane (18) being used by the computing means (60) in computing the size of the balance weights."

"12. A method for determining the radius of a balance weight receiving location (15) of a wheel (9) from the rotational axis (7) of the wheel (9) and for determining the distance of the balance weight receiving location (15) from a reference plane (18), using the apparatus (16) as claimed in any of claims 1 to 11, for use in computing the size of a balance weight, the method comprising the steps of:
moving the mounting means (17) so that the signals

of the sensor means (26,27) move over at least portion of the radial sides (33,34) of the wheel (9),
recording and storing the distances of the surface (37) of portion of each radial side (33,34) of the wheel (9) from the reference plane (18) against the corresponding positions of the mounting means (17) at a plurality of different positions of the mounting means (17) at intervals as the mounting means (17) is moved,
comparing some of the stored values against reference parameters of reference wheels for determining the type of wheel and for determining the radius (R_1) of the balance weight receiving location (15) from the reference parameters,
determining the distance of the location (12,13) from the reference plane (18) from at least some of the stored values of the output signals received from the sensing means, and
computing the size of the balance weight from the computed radial distance (R_1) and the distance (x_1,y_1) from the reference plane (18)."

V. The arguments of the appellant can be summarised as follows.

Document EH5 does not disclose recording and storing output signals from sensing means corresponding to distances from the side faces of the wheel and comparing with reference wheels as claimed in the independent claims. There is absolutely no suggestion in EH5, nor in any other prior art document, of providing such storing and comparing. Identification of the wheel type from reference parameters enables

computing balance weight receiving location from the stored signals. Therefore protrusions are not falsely identified as locations. The subject matter of the independent claims accordingly involves an inventive step.

VI. The arguments of the respondent can be summarised as follows.

Since the program controlled device of EH5 calculates wheel rim position and wheel diameter from lateral sensing by a sensing means moved in a predetermined path over portion of the side faces of the wheel, the radial and tangential wheel measurements were necessarily determined with reference to fixed reference planes and points, stored and associated with balance weights. It was only a constructional measure for the skilled person to determine which fixed points and planes and what distance still had to be calculated. Since these calculating methods were also part of the knowledge of the skilled person, no basis for an inventive step can be seen. This is the case for the claims according to all requests on file before the oral proceedings as no more is involved than purely constructional methods which were known or obvious to the skilled person on the basis of the prior art or his specialist knowledge.

VII. At the end of the oral proceedings, the appeal board gave its decision.

Reasons for the Decision

1. *Admissibility*

The appeal complies with the provisions mentioned in Rule 65(1) EPC and is therefore admissible.

2. *Amendments - Article 123(2) and (3) EPC*

2.1 Claim 1 derives from claim 16 as granted further limited by features present in claims 9 to 11 as granted, with furthermore explicit recitation that there is provided (1) means for determining from the reference parameters the radial distance location of the balance weight receiving location from the rotational axis and (2) computing means computing from the output signals received from the sensing means and stored in the storing means the distance of the balance weight receiving location from the reference plane.

2.2 Claim 12 derives from claim 18 as granted further limited by method features corresponding to features present in claim 11 as granted with furthermore explicit recitation of (1) determining the radius of the balance weight receiving location from the reference parameters (see the middle paragraph of column 16 of the patent) and (2) determining the distance of the location from the reference plane from at least some of the stored values of the output signals received from the sensing means (see for example the sentence contained in lines 14 to 17 of column 17 of the patent).

2.3 There have never been any submissions calling into question that the amendments made were supported by the documents as filed and the board is satisfied that this is indeed the case. The amendments made result in

further limitation of the claims. Therefore, the board is satisfied that the requirements of Articles 123(2) and (3) are complied with.

3. *Novelty - Article 54 EPC*

3.1 The board is satisfied, consequent to the Italian Patent Law and especially Article 4 thereof, that document EH5 was made available to the public before the priority date of the patent.

3.2 Claims 1 and 12 contain features involving comparison of wheels with reference wheels to determine the radius (radial distance) of the balance weight receiving location and distance from the reference plane of the location, such as occur in claim 1 and in claim 12 as mentioned in 2.1(1),(2) and 2.2(1),(2), respectively. Document EH5 relies either on an operator knowing the diameter of the wheel rim or on direct measurement of the location (see page 5, lines 26 to 27 and the paragraph bridging pages 5 and 6 of the English translation) and so contains no disclosure of these features. Therefore, having regard to document EH5, the subject matter of claims 1 and 12 is novel within the meaning of Article 54 EPC.

4. *Inventive Step - Article 56 EPC*

4.1 Comparison of wheels with reference wheels permits an enhancement in determination of the balance weight receiving location compared with the closest prior art (EH5) because once a wheel type is determined, the values from the sensing means at the correct location can be used because this location is type dependent.

Accordingly, the objective problem addressed by the invention can be seen in discriminating between this correct location for fixing weights and any spurious locations which may be directly detected by the sensor means responsive to protrusions on the wheel. The solution to this problem is provided by the independent claims of the patent.

4.2 This problem is not addressed in document EH5, because it is there taught that either (a) an operator knows the wheel type and positions the casing correspondingly, thus opening the possibility of operator error in determination avoided by the invention or (b) direct measurement is accurate enough in the automatic solution to determine the location, thus leaving open the possibility of use of spurious locations. The respondent has not identified nor is the board aware of any other prior art document coming closer than document EH5 to dealing with the problem addressed by the invention. The board therefore sees no reason to suppose that the skilled person would apply his skilled knowledge other than to implement the alternatives according to the teaching of EH5 which would not have resulted in the subject matter of the independent claims. Accordingly, the subject matter of the claims is not obvious and is considered to involve an inventive step within the meaning of Article 56 EPC.

5. *Adaptation of the description*

5.1 In view of the adaptations necessary in the description the board exercises its discretion under Article 111(1) EPC to remit the case to the first instance.

5.2 The introduction to the description should mention document EH5 and be adapted to the claims. The detailed description of the preferred embodiments also requires adaptation to the more restricted subject matter now claimed, needing careful consideration to ensure that full consistency with the amended independent claims is guaranteed.

In this context, the department of first instance should in particular deal with the issue of removing any inconsistencies in the description relating to the features of claims 1 and 12 mentioned in 2.1 (1),(2) and 2.2(1),(2), respectively. Consideration should be given for example to column 21, the first six words of line 31, the last seven words of the sentence ending "hubs" in lines 47 to 48 of column 21, and the sentence contained in lines 13 to 20 of column 25.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in amended form on the basis of claims 1 to 14 presented at the oral proceedings with the description to be adapted and the drawings as in the patent specification.

The Registrar: The Chairman:

E. Görgmaier E. Turrini