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**Datasheet for the decision
of 28 January 2009**

Case Number: T 0521/06 - 3.4.02

Application Number: 96903362.0

Publication Number: 0909371

IPC: G01B 1/00

Language of the proceedings: EN

Title of invention:

Vibration damper for coordinate measuring machine

Patentee:

Hexagon Metrology AB

Opponent:

Carl Zeiss AG

Headword:

-

Relevant legal provisions:

EPC Art. 56

Relevant legal provisions (EPC 1973):

-

Keyword:

"Inventive step - claims 1, 11 (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0521/06 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 28 January 2009

(Opponent) Carl Zeiss AG
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Representative: -

Respondent: Hexagon Metrology AB
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 14 March 2006
rejecting the opposition filed against European
patent No. 0909371 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: A. G. Klein
Members: M. Rayner
M. J. Vogel

Summary of Facts and Submissions

I. The opponent appealed against the decision of the opposition division rejecting its opposition against European patent No. 909 371 (application number 96903362.0, International Publication number WO96/24025). The patent concerns coordinate measuring machines. The decision under appeal referred to documents including the following:

E1	US-A-5 042 162
E5	DE-A-31 03 146

II. In the decision under appeal, the opposition division identified features of documents E5 relating to horizontal arm coordinate measuring machines corresponding to features claimed in independent claims 1 and 11 of the patent in dispute. Inventive step was considered to turn on the last feature of apparatus claim 1 (or the last feature of method claim 11) relating to a vibration damper and its positioning. The division reached the view that document E1 refers to a gantry type coordinate measuring system having vibration dampers. However, as a horizontal arm coordinate measuring machine is a different type of machine with a different type of vibration behaviour, the teachings of document E1 would not be applied thereto. The specific solution given in claims 1 and 11 cannot therefore be provided by document E1, in particular there is no provision for locating the vibration damper over the column and on a side of the column opposite of the probe of a horizontal coordinate measuring system so that the column is intermediate the first vibration damper and the probe. Another

indication of inventive step is the timeframe, as the machines have been known for years, but the prior art does not show the positioning of the damper.

- III. The appellant (=opponent) requests that the decision under appeal be set aside and the patent be revoked. Oral proceedings are requested on an auxiliary basis.

According to the appellant, the skilled person had significant reason to consider the vibrational mechanics of carriages disclosed in documents E1 and E5 similar in view of the similarity of apparatus. In transferring the teaching of document E1 about the gantry vibration damper being as far as possible from the X-axis drive to an apparatus according to document E5, the specific solution mentioned by the opposition division would have been reached by the skilled person. Consequently, starting from document E5, in the light of document E1, the skilled person obviously reaches the features claimed in claim 1 or 11, the subject matter of which does not therefore involve an inventive step. Moreover, not publishing an idea at a particular time does not make it patentable.

- IV. The respondent (=patent proprietor) requested that the appeal be dismissed. Oral proceedings were requested on an auxiliary basis.

According to the respondent, the appellant attempts to give the wrong impression that a gantry integrated damper corresponds to the damper according to the contested patent for reducing arm type vibrations in the X and Z directions which do not occur in a gantry type coordinate measuring machine. It is not clear why

and how the skilled person should have combined the teaching of documents E5 and E1, and even had this been done, the subject matter of claim 1 or 11 would not have been reached. The respondent agreed with the decision under appeal.

- V. Consequent to auxiliary requests by both parties, oral proceedings were appointed by the board.

During the oral proceedings, the parties agreed both that novelty of claims 1 and 11 was provided by the last feature thereof and that the problem to be solved was improving damping of the machine known from document E5.

The appellant argued that the maximum moment arm according to the teaching of document E1 is as far from the X-drive as possible, which meets the position claimed in the patent in dispute.

The respondent underlined that no document at all in the prior art dealt with both a horizontal arm type and gantry type machine, despite the machines being available for twenty years. A combination of teachings from documents E5 and E1 relating to the two machines was not proper because reference E5 does not teach how to deal with oscillations around the same axes as in the patent in dispute. In particular, the patent in dispute is concerned mainly with the X and Z directions, the Y-direction play a subordinate role, whereas according to document E5, the damper should be as far as possible away from the X-axis in the Y direction. The patent in dispute also addresses the problem of low speed vibration. Even if made, combining the documents

would not have led to the subject matter claimed because "as far away as possible" does not correspond to the damper position claimed. It was a major effort for the inventor to have found the correct position. Additional, while the representative indicated that he was not in a position to present any evidence in support, he remarked that there had been a high turnover in the machine according to the invention, indicating it had been a long felt want.

VI. The independent claims of the patent in dispute are worded as follows.

"1. A coordinate measuring machine comprising:
a generally horizontal table (16);
a generally vertical column (12) coupled to the table for relative movement with respect to the table in a first direction;
a carriage (24) disposed on the column (12), the carriage being movable in a second direction perpendicular to the table, the carriage supporting a rail (26) that is movable in a third direction, wherein the first, second and third directions are mutually orthogonal;
a probe mounted (28) on the rail (26); and
a first vibration damper (36) positioned over the column (12) and positioned on a side of the column (12) opposite of the probe (28) so that the column (12) is intermediate the first vibration damper (36) and the probe (28) in the third direction, the vibration damper (36) reducing the amplitude of vibrations that occur when the column moves.

11. A method for improving accuracy and throughput of a coordinate measuring machine having a table (16), a column (12) coupled to the table for relative movement of the column (12) with respect to the table in a first direction, a carriage (24) disposed on the column (12) and being movable in a direction perpendicular to the table (16), the carriage (24) supporting a rail (26) that is movable in a third direction, wherein the first, second and third directions are mutually orthogonal, and a probe (28) disposed on the rail (26), the method comprising the step of:

positioning a first vibration damper (36) over the column (12) on a side of the column opposite of the probe (28) in the third direction so that the column is intermediate the first vibration damper and the probe (28) in the third direction whereby the amplitude of steady-state vibrations is reduced when the probe (26) is being moved relative to the table (16)."

VII. The board gave its decision at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.
2. During the appeal procedure, reference has been made by the parties, consistent with the documents in the file, to the first, second and third direction as claimed as the X-direction, the Z-direction and the Y-direction, respectively. The board will adhere to this referencing

system in the following, remarking for reader orientation that the Z-direction is vertical.

3. Novelty with respect to document E5

3.1 It is common ground between the appellant and respondent that only the last feature of machine claim 1, i.e.

"a first vibration damper (36) positioned over the column (12) and positioned on a side of the column (12) opposite of the probe (28) so that the column (12) is intermediate the first vibration damper (36) and the probe (28) in the third direction, the vibration damper (36) reducing the amplitude of vibrations that occur when the column moves",

is novel with respect to known horizontal arm coordinate measuring machines such as disclosed in document E5. A corresponding situation exists with respect to the last feature of method claim 11. The board sees no reason not to share this view of the parties.

4. Teaching of the patent in dispute

4.1 Consideration of the disclosure of the patent in dispute in relation to the novel feature reveals that vibration damper 36 positioned over and to the side of column 12 (see column 3, line 56) contributes to damping vibration caused by acceleration and deceleration of the X-rail (see column 4, lines 21, 22) creating a bending and twisting movement in column 12. In particular, damper 36 attenuates vibrations in

column 12 (see column 5, line 4) and helps to dampen vibrations due to twisting movement of column 12 as the X-drive assembly accelerates and decelerates (see column 5, lines 11-13).

4.2 The board observes that since the acceleration or deceleration is in the X-direction, the "bending" will be about the Y-axis (from the moment in the X-Z plane) and the "twisting" about the Z-axis (from the moment in the X-Y plane).

5. Document E1

5.1 Document E1 concerns a gantry type coordinate measuring machines and likewise deals with damping vibrations caused by X-drive acceleration and deceleration (see for example column 6, lines 42-44), which vibrations are damped by gantry vibration damper 30. The document teaches that the damper 30 has its greatest damping effect if it is positioned as far away from the coupling point of the X-rail drive in the Y and Z directions as is practicable (e.g. column 3, line 60 or column 9, line 14).

5.2 The reason for this is to provide the longest moment arm. Therefore not only vibrations in the X-Z plane (moment about Y-axis) are damped according to the teaching of document E1, but also vibrations in the X-Y (moment about Z-axis). What is not damped is vibration in the Y-Z plane (moment about X-axis).

6. Inventive Step

6.1 It was agreed by the parties that the problem solved by the feature novel over document E5 is improving damping. The board concurs with this view. As can be seen from the analysis above, the board agrees with the position of the appellant that both the patent in dispute and document E1 deal with vibrations deriving from moments about the same axes and deriving from acceleration and deceleration of the X-drive, generating moments in the X-Z and X-Y planes.

6.2 In considering improving damping, it has to be borne in mind that the concept of positioning dampers on various differently structured measuring and machining devices with different vibrational properties is generally known to the skilled person. What the different properties are and how to position the dampers is, at the start, not of course known. The focus in the present case is not, however, on such different specific properties as argued by the respondent because, as convincingly argued by the appellant, what is at issue is mitigating undesired vibration which is essentially similar because it derives from a common source, i.e. acceleration and deceleration of the X-drive of a coordinate measuring, be it of the gantry or horizontal arm. The board thus concurs with the appellant in this particular situation that the machines are not so different as to mean that the skilled person would not have taken the "as far away as practical" teaching of document E1 into consideration when seeking to improve damping of the machine known from document E5.

7. A self evident difference between a horizontal arm machine (document E5) and a gantry type machine (document E1) is, nevertheless, that the supporting structure comprises a bridge between two columns in the gantry type machine, rather than an extendable Y-rail supported by a single vertical column. This means that a point as away as practical from the X-drive in the Y and Z directions is high up on the column on the other side of the bridge for a gantry type machine. For a horizontal arm type machine, a point as away as practicable from the X-drive in the Y and Z directions is high up and on the other side of the single column. No more than the latter is defined in the novel feature pertaining to damper position in independent claims 1 and 11 as the drive is on the probe side of the column in document E5. In other words, having concluded that the teaching of damping the vibrations deriving from the X-drive can be properly combined with that of document E5, the board agrees with the appellant that there no inventive step can be considered present in the subject matter of claim 1 over that combination. A method of improving accuracy and throughput of a coordinate measuring machine as claimed in claim 11 can also not be considered to involve an inventive step for corresponding reasons.

8. The respondent argued that the inventor had invested significant effort in finding an appropriate damper and position for the horizontal arm apparatus. While the board finds this argument entirely plausible, it does not help the respondent's case because no special definition of the damper or its properties going beyond what is obvious over the teaching of documents E5 and E1 is present in the claims. Moreover, there is no

feature claimed differing over the obvious subject matter and which pertains to solving any further problem specific to low speed vibration or any other vibration.

9. It is not necessary to provide a single document showing both types of coordinate measuring machine to present a convincing case for lack of inventive step as the link between documents E5 and E1 is provided by the X-drive common to both so the argument of the respondent in this sense failed to convince the board. The case against inventive step is convincing so that possible support indicia for inventive step based on the timeline of document publication cannot tip the balance in favour of the respondent in the present case. Thus, in agreement with the appellant, the board does not, in the present case, consider either the length of time coordinate measuring machines have been known or any gap between the publication dates of documents E1 and E5 to permit the conclusion that the claimed subject matter involves an inventive step. Moreover, the respondent presented no evidence in relation to turnover or sales in support of the argument that there had been a long felt want. At least for this reason, the board was not able to accept this argument as persuasive in relation to inventive step.

10. Since, accordingly, the subject matter of independent claims 1 and 11 cannot be considered to involve an inventive step, the patent in dispute cannot be considered to satisfy the requirements of the Convention. Accordingly, the case of the appellant succeeds and that of the respondent fails.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar

The Chairman

M. Kiehl

A. G. Klein