BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Publication in the Official Journal Yes / No

File Number: T 662/89 - 3.2.1

Application No.: 81 401 523.6

Publication No.: 0 050 544

Title of invention: Method of assembling a machine tool and machine tool

Classification: F16B 11/00, B23Q 1/00

DECISION
of 27 June 1991

Proprietor of the patent: The Warner & Swasey Company

Opponent: 01 Index Werke KG
02 SKC Gleitbeschläge

Headword:

EPC Art. 54, 56

Keyword: "Novelty (yes)"
"Inventive step (after amendment, yes)"

Headnote

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 662/89 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 27 June 1991

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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 9 August 1989 rejecting the opposition filed against European patent No. 0 050 544 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : P. Alting van Geusau
J.-C. Saisset

Summary of Facts and Submissions

I. European patent No. 0 050 544 in respect of European patent application No. 81 401 523.6, which was filed on 2 October 1981, was granted with 5 claims on 3 December 1986 (cf. Bulletin 86/49).

II. On 28 and 29 August 1987 notices of opposition were filed by the Appellant (Opponent 1) and, respectively, further party to the present appeal proceedings (Opponent 2) requesting revocation of the patent on the grounds that its subject-matter lacked novelty and inventive step. The oppositions were supported, inter alia, by the following documents:

D5: GB-A-13 659 AD1915
D6: US-A-2 974 080
D7: US-A-3 534 643
D8: DE-A-1 577 136

III. By a decision of 9 August 1989 the Opposition Division rejected the oppositions since in their opinion the cited prior art did neither take away the novelty of nor give any lead to the solution of the underlying problem of the invention such as defined in the independent claims 1 and 5 of the patent in suit.

IV. An appeal was lodged against this decision on 5 October 1989 and the appropriate fee was paid on the same day.

The statement of grounds of appeal was received on 6 December 1989.

V. In a communication dated 19 February 1991 the Board invited the parties to oral proceedings, as was auxiliarily requested by the Appellant and the Respondent (proprietor).

In the communication the Board expressed their preliminary opinion that starting from the closest prior art disclosed in US-A-3 534 643 (D7), it would appear to be obvious to the skilled person that for maintaining an aligned position of the lathe's headstock and wayblock portions a filler such as known from D8 or D6 should be used. Further, since D5 discloses an integrally cast headstock and bed arrangement the question arises whether an integral headstock bed portion and a positioning respectively alignment achieved by a filler applied between a rough spindle bore and spindle assembly, involves an inventive step.

VI. In the oral proceedings held on 27 June 1991 the Respondent filed new claims 1 to 4 of which claim 1 reads as follows:

"1. A method of assembling a machine tool (10) comprising the following sequential steps:

(a) forming a cast one-piece member (12) having a slant bed portion (14) and a headstock portion (16) with a rough spindle bore (74) formed therethrough;

(b) positioning a wayblock (32) having ways (34, 36, 37, 38) and support means (100, 102, 104) on the slant bed portion (14) at a desired position with respect to the rough spindle bore (74);

(c) mounting a tailstock assembly (30) on the wayblock (32);

(d) aligning the tailstock assembly (30) directly with the rough spindle bore (76) by positioning the wayblock (32);

(e) forming dam means around the support means (100, 102, 104) of the wayblock (32);

(f) introducing a hardenable filler (80) between the support means (100, 102, 104) of the wayblock (32) and the slant bed portion (14) to permanently position the wayblock (32);

(g) positioning a spindle assembly (18) having an outer housing (118) and an inner member (124) rotatable with respect to said outer housing (118), at a desired position in the rough spindle bore (74) of the headstock portion (16) of the cast one-piece member (12);

(h) aligning the spindle assembly (18) and the wayblock (32) directly one with the other so that the rotatable member (124) and the ways (34, 36, 37, 38) are in a desired relative alignment;

(i) forming dam means between the spindle housing (118) and the headstock portion (16) of the one-piece member (12);

(j) introducing a hardenable filler (114) between at least a portion of the spindle housing to permanently position the rotatable member (124) and the ways (34, 36, 37, 38) in the desired relative alignment."

VII. In the appeal proceedings the Appellant referred to further prior art documents among which were the following patent publications:

D15: DD-A-129 134
D22: DE-A-2 256 029.

The Appellant's arguments submitted in writing and expressed orally during the oral proceedings - so far as these arguments are still relevant considering the subject-matter of the amended claims - can be summarised as follows.

As regards the formal admissibility of claim 1 the Appellant was of the opinion that feature (d) did not have a basis in the application as filed and that therefore claim 1 was not acceptable for reasons of Article 123(2) respectively Article 100(c) EPC.

Novelty was no longer contested but the Appellant was of the view that D5, representing in his opinion the closest prior art, already contained in terms of equivalent features all the essential parts of the claimed machine tool. Although the exact method of assembling was not disclosed in D5 the skilled person would necessarily arrive at the claimed assembling method because obviously also in D5 aligning of the spindle with respect to the ways must be carried out before the parts are permanently positioned by means of the filler. The feature relating to a "slant" bed portion was not considered to have any importance and was in itself already known from D7 and D22.

Also when starting from D7 the subject-matter of claim 1 lacks an inventive activity in view of the fact that it is well known from the further cited documents, in particular D6 and D8 to position, align and fix machine tool parts using a hardenable filler as a filling and mounting means. The aligning steps in claim 1 are nothing more than a selection among a limited number of possibilities all of them being well known to the skilled person.

VIII. The Respondent contested the arguments brought forward by the Appellant. Concerning the formal acceptability of Claim 1, he was of the opinion that, as regards the basis for the feature (d) in the originally filed application, the skilled man would immediately recognise that the particular manner of aligning by means of a bar and discs disclosed in the patent was just one preferred possibility

but that this preferred possibility could not be considered to be the only one.

With respect to the slanted bed surface for mounting of the wayblock the Respondent submitted that a slanted surface when compared to a flat surface resulted in easier manipulation when positioning the wayblock with respect to the rough spindle bore. Further, by aligning the wayblock with respect to the rough spindle bore by means of the tailstock mounted to it, then fixing the wayblock to the bed and thereafter aligning the spindle assembly directly with the wayblock, a highly accurate machine tool could be provided.

None of the cited documents refers to an aligning procedure as now claimed and in view of the achieved advantages with respect to easy adjustment and high accuracy the assembling method of claim 1 should be considered to be based on an inventive activity.

XI. The Appellant requests that the impugned decision be set aside and that the patent be revoked in its entirety.

The Respondent requests that the appeal be dismissed and that the patent be maintained on the basis of claims 1 to 4 and the description as filed during the oral proceedings together with the drawings as granted.

X. The other party (Opponent 2) did not file any letter nor was he represented at the oral proceedings.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is admissible.

2. Admissibility of the amended claims

2.1 Claim 1 is based on the originally filed claim 1 and contains further features disclosed in the application as filed with regard to the preferred embodiment of the invention.

2.2 According to the single embodiment disclosed in the application to which claim 1 now closely relates, aligning is carried out in a particular manner i.e. by means of a rod mounted in the tailstock assembly and a pair of discs mounted on the outer end of the rod and cooperating with the headstock opening. In the Appellant's opinion these measures should be included in claim 1 in order that the requirements of Article 123(2) respectively Article 100(c) EPC are met.

2.3 Considering this objection the Board draws attention to the fact that in addition to the embodiment described in the original description the application also contained in claim 1 an alignment step d) in which in general terms aligning of the spindle assembly and wayblock was referred to.

In view of this general disclosure of aligning, the skilled person would, in the Board's opinion, immediately realise that instead of the aligning means described with respect to the preferred embodiment also other aligning means well known and readily applicable for an expert could be substituted for the one described particularly.

2.4 Therefore, when restricting the subject-matter of the original claim 1 respectively granted claim 1, to relate more closely to the preferred detailed embodiment

disclosed in the description, the present generalisation of the aligning steps defined in feature d) is considered to have at least an implicit basis in the application documents and as such is considered to be acceptable in the present case.

2.5 Since the subject-matter of claim 1 under consideration is thus not extended beyond the content of the application as filed and because claim 1 is now limited in scope when compared to the subject-matter of the granted claim 1, both the requirements of Article 123(2), and Article 123(3) EPC are met.

2.6 It is noted that claim 1 is not drafted in the two-part form such as required by Rule 29(1) EPC. Considering that in the present case the claimed method defines a particular succession of method steps while the available prior art documents at the most disclose some of these steps in isolation, a two-part form of the claim would require a rearrangement of the features resulting in effect in a more complex and as regards the sequence of method steps, less easy to understand form of claim. Under these circumstances the present one-part form is considered to be more appropriate and thus acceptable.

3. Novelty

3.1 The prior art coming closest to the subject-matter as now claimed is disclosed in D7. Although the exact manner of assembling the machine tool of D7 is not referred to the Board considers it to be justified that the skilled person would immediately understand that the following method steps of claim 1 under consideration are implied:

A method of assembling a machine tool comprising the steps of:

(a)' forming a cast one-piece member (11) having a slant bed portion (14);

(b)' positioning a wayblock (24), having ways formed thereon, at a desired position on the bed portion;

(g)' positioning a spindle assembly having an outer housing (22) and an inner member rotatable with respect to said outer housing, at a desired position with respect to the slant bed portion of the cast one -piece member;

(h)' aligning the spindle assembly and the wayblock so that the rotatable member and the ways are in a desired relative alignment.

3.2 The method of claim 1 under discussion differs from this known method by

(a)" the cast one-piece member comprises a headstock portion (16) with a rough spindle bore (74) formed therethrough,

(b)" positioning the wayblock comprising support means (100, 102, 104) on the slant bed portion (14) at a desired position with respect to the rough spindle bore (74);

(c) mounting a tailstock assembly (30) on the wayblock (32);

(d) aligning the tailstock assembly (30) directly with the rough spindle bore (76) by positioning the wayblock (32);

(e) forming dam means around the support means (100, 102, 104) of the wayblock (32);

machine tool alternatives and as such cannot be regarded to be of any significance.

However even when considering that the skilled person would recognise that the guide rods 35 in Fig. 1 of D5 represent "ways" for the tool carriage, aligning and fixing of these guide rods is different when compared to a wayblock since the ways on the wayblock already have a fixed relationship whereas the known guide rods must also be aligned with respect to each other.

For these reasons the Appellant's arguments with respect to D5 are not considered conveincing.

3.4 Since none of the available prior art documents comes any closer to the subject-matter of claim 1 than D7 or D5, and novelty of the subject-matter of claim 1 was not further in dispute, the Board sees no need for further detailed substantiation of this matter.

4. Inventive step

4.1 Starting from the closest prior art as represented by D7 the objective problem underlying the method of assembling a machine tool according to claim 1 under discussion can be seen in the provision of a method of aligning the spindle axis of a spindle assembly relative to the plane of a wayblock in a machine tool of the type disclosed in D7 in an easy and less costly but nevertheless accurate manner (see also column 1, lines 26-31 and lines 56-64 of the amended patent specification).

4.2 For solving the above problem the skilled person must, in the Board's opinion, be considered to be aware of the prior art disclosed in D5, D6 and D8.

In particular D5 teaches the positioning and fixing of a spindle assembly in an integrally cast headstock portion by means of a filler when the spindle drive is of a simpler type than in D7 (direct belt-drive to the spindle). D6 and D8 concern the use of plastic fillers for adjusting and mounting machine tool elements with respect to each other. Moreover D8 refers to the use of "dam means" around the space to be filled with the filler (see page 2, lines 11 to 21 of D8).

In view of these disclosures it would, in the Board's opinion, have been obvious to apply the method steps (a)", (e), (f), (i) and (j) to the disclosure of D7.

4.3 However, the Board observes that the documents D5, D6 and D8 and also the further available prior art are silent about the sequence and manner of positioning and aligning of the machine tool parts themselves.

In this respect, the Respondent's arguments with respect to the functional interaction of the features (b), (c), (d), (g)" and (h)" of claim 1 as indicated here above are considered to be of great relevance.

By positioning and aligning the wayblock with respect to the rough spindle bore first, which bore cannot be considered to represent an accurate datum surface and therefore this step must be considered to go against normal positioning and aligning practice, initial aligning is carried out during which - because of the slant surface the wayblock is positioned on and as a consequence of using the tailstock assembly as an aligning reference - easy handling and more accurate positioning can be achieved. After fixing of the wayblock by means of the hardenable filler, the spindle assembly and wayblock are aligned directly one with the other so that a very

accurate alignment result of these machine tool parts can be achieved in a relatively simple manner.

4.4 Although, as was also put forward by the Appellant, D7 shows a slant positioning surface for the headstock assembly and the Board considers it to be clear for the skilled person that this mounting surface provides the necessary adjustment for the known headstock assembly this prior art is silent about the manner how the positioning and aligning of the headstock and wayblock is carried out. Further, because the headstock assembly is positioned itself, D7 cannot lead the skilled person to position the wayblock with respect to a rough spindle bore first.

Moreover, D7 does not show a tailstock and therefore cannot provide any hint using a tailstock when mounted on the wayblock for aligning the latter with the spindle bore.

In this respect also D5 cannot, in the Board's opinion, give any assistance for solving the underlying problem for the reason that its tailstock is integral with the bed rather than mounted on the guide rods 35 which could be considered to represent "ways".

.5 It cannot, in the Board's opinion, be said either that the assembling method defined in claim 1 is an obvious derivation of the machine tool assembling method disclosed in D5, as was submitted by the Appellant.

The machine tool disclosed in D5 is of substantial different construction with regard to the guides for the tool carriage themselves as well as their mounting on the bed comprising four sleeves each of them being fixed to lugs instead of a wayblock mounted on one slant mounting

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 with the following documents:

   - Claims 1 to 4 and the description as filed during the oral proceedings,

   - drawings as granted.

The Registrar: The Chairman:

S. Fabiani F. Gumbel