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D E C I S I O N
of 9 February 1999

Case Number: T 0749/96 - 3.2.5

Application Number: 91202774.5

Publication Number: 0482722

IPC: D03D 47/12

Language of the proceedings: EN

Title of invention:
Gripper guide for double-gripper weaving machines

Patentee:
N.V. Michel Van de Wiele

Opponent:
Günne Webmaschinenfabrik GmbH & Co. KG

Headword:
-

Relevant legal provisions:
EPC Art. 84, 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0749/96 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 9 February 1999

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 4 July 1996 concerning maintenance of European patent No. 0 482 722 in amended form.**

Composition of the Board:

Chairman: A. Burkhart
Members: C. G. F. Biggio
J. P. B. Seitz

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the interlocutory decision of the opposition division, maintaining the European patent No. 482 722 in amended form.

Opposition was filed against the patent as a whole, based on Article 100(a) EPC in conjunction with Article 56 EPC (lack of an inventive step), and on Article 100(c) (lack of original disclosure).

The opposition division held that the grounds for opposition mentioned in Article 100(a) and (c) EPC did not prejudice the maintenance of the patent in amended form, having essentially regard to the prior art documents D1 = EP-A-0 312 031 and D5 = FR-A-1 555 432.

II. Amended Claim 1, as maintained by the opposition division, reads as follows:

"Gripper guide for gripper weaving machines, comprising a drive wheel (2, 2') disposed at the rear side of a gripper-bar (4, 4') and a guide strip (7, 7') which is extending along that same side in the direction of the motion of said gripper-bar (4, 4'), wherein opposite the drive wheel (2, 2') at the front side of the gripper-bar (4, 4') a roller (20, 20') is disposed in such a way that the gripper-bar (4, 4') is held between the roller (20, 20') and the drive wheel (2, 2'), **characterized** in that at the front side of the gripper-bar (4, 4') parallel to the guide strip (7, 7') a slide strip (8, 8') is disposed in such a way that the gripper-bar (4, 4') can move to and fro between the guide strip (7, 7') and the slide strip (8, 8') as parts of an U-shaped guide channel, sliding with its front side against said slide strip (8, 8'), and that

the slide strip (8, 8') is fixed opposite the guide strip (7, 7') by means of one or more hinges (9, 10, 13, 14) permitting easy and rapid removal of the slide strip (8, 8'), said guide channel extending approximately from said drive wheel (2, 2') to the rearward end of said guide strip (7, 7')".

III. Oral proceedings, before the Board of appeal, were held on 9 February 1999.

The appellant (opponent) requested that the decision under appeal be set aside and the European patent be revoked in its entirety.

The respondent (patentee) requested

as main request, that the appeal be dismissed and that the patent be maintained as amended by the first instance, and

as auxiliary request, that the patent be maintained on the basis of a further amended Claim 1, filed at the oral proceedings.

IV. The appellant essentially argued as follows.

The wording of Claim 1, according to both the main and the auxiliary requests, was open to an objection pursuant to Article 84 EPC, because the last feature of said claim: "... said guide channel extending approximately from said drive wheel (2, 2') to the rearward end of said guide strip (7, 7')", owing to the presence in it of the adverb "approximately", was ambiguous. This wording, in fact, did not unambiguously state whether or not the guide channel extended over the whole length between the drive wheel and the rearward end of the guide strip.

Document D3 (GB-A-2 200 657), or its equivalent D4 (DE-C-3 703 316), should be considered as the closest prior art on file.

Document D3 addressed the objects of preventing harmful vibrations and of enabling easy dismantling or installing of the gripper-rod (see: page 2, last paragraph).

Document D3 had, accordingly, the purpose of solving the same kind of technical problem as the contested patent, so that the objective technical problem underlying the alleged invention should be reformulated as being that

- of adapting the solution known from document D3 to double-gripper weaving machines, and accordingly,

- of increasing the accessibility of the gripper-bars of such machines, for purpose of inspection and/or exchange thereof, and

- of further reducing the wear deriving from the specific vibrations of the gripper-bars in the plane orthogonal to the drive wheel axis, thereby extending the period of proper operation of said gripper-bars.

By the adaptation of the solution known from document D3 to double-gripper weaving machines, the person skilled in the art would have considered as obvious that the axis of the driving wheels should be arranged vertically and not horizontally, as in single-gripper weaving machines. He would have, accordingly,

considered as obvious to rotate over an angle of 90° both the axis of the driving wheel and, consequently, the U-shaped channel 4 in which the gripper-rod of document D3 was disposed, for sliding movements to and fro.

In order to increase the accessibility of the gripper-bar according to document D3, the person skilled in the art would have also considered as obvious to dispense with the protective tube 1 in which the U-shaped channel 4 was located, since, according to document D3, said protective tube 1 had, indeed, merely a protective function, but no guiding function for the gripper-rod.

By doing so, the person skilled in the art would arrive to a mechanical arrangement which differed from the subject-matter of Claim 1 of the contested patent only by the features: "providing hinges for the slide strip" and "arrangement of the U-shaped guide channel so that the guide strip is opposite the drive wheel".

These features were suggested by the teaching of document D5, showing swivel-mounted guide elements opposite the drive wheel, and D11, showing a guide strip continuously extending all along the needle.

V. The respondent essentially argued as follows.

The wording of the feature: "... said guide channel extending approximately from said drive wheel (2, 2') to the rearward end of said guide strip (7, 7')", in spite of the presence in it of the adverb "approximately", might not be considered as open to objection pursuant to Article 84 EPC. This wording

meant that the guide channel extended over the whole length between the drive wheel and the rearward end of the guide strip, thereby coming so close as possible both to the drive wheel and to the rearward end of the guide strip.

If the person skilled in the art tried to adapt the gripper device known from document D3 to double-gripper weaving machines, he could have considered

- that the axis of the driving wheels should be arranged vertically and not horizontally, as in single-gripper weaving machines,

- that, accordingly, both the axis of the driving wheel and, consequently, the U-shaped channel 4 in which the gripper-rod of document D3 was disposed, for sliding movements to and fro, should be rotated over an angle of 90°, and

- that, in order to increase the accessibility of the gripper-bar according to document D3, the protective tube 1 in which the U-shaped channel 4 was located should be dispensed with, since, according to document D3, said protective tube 1 had merely a protective function, but no guiding function for the gripper-rod.

However, even by doing so, the person skilled in the art would have, nevertheless, not yet achieved the claimed invention, because the mechanical arrangement he could have proposed would have still differed from the claimed one, at least, in that "at the front side of the gripper-bar and opposite the drive wheel a slide strip is fixed opposite the guide strip by means of one or more hinges permitting easy and rapid removal of the slide strip".

In the device according to D3, a rotation over an angle of 90° of the U-shaped channel 4 with respect to the axis of the driving wheel, which relative rotation would have been necessary in order to obtain the feature "a slide strip at the front side of the gripper-bar and opposite the drive wheel", would have disregarded a significant and compulsory portion of the teaching from said document, i.e. the statement that the U-shaped guide rail is **open at the top**, i.e. open opposite the drive wheel, so that the gripper-rod inside the U-shaped profile can easily be **lifted out**, away from the driving wheel.

Document D5 did not disclose or suggest the provision of a slide strip opposite the drive wheel extending all along the front side of the griper-bar.

Document D11, which was not concerned with high-speed gripper weaving machines but with low-speed pile-fabric producing needle looms, would not have been considered by the person skilled in the art looking for a solution of the problem underlying the invention. Moreover, the supporting race-way for the needle, disclosed in D11, had a triangular cross-section which was not suitable as a guiding channel for a gripper-bar of a gripper weaving machine.

The subject-matter of Claim 1 was neither rendered obvious by any of the teachings of documents D3, D5 or D11, alone, nor by the combination of said teachings.

Reasons for the Decision

1. The appeal is admissible.

2. *Late Filed Document D11*

Though this document has to be considered as "late filed", the Board admits its introduction into the procedure, because Claim 1, as granted, has been amended with the insertion of the not previously claimed feature: "... said guide channel extending approximately from said drive wheel (2, 2') to the rearward end of said guide strip (7, 7')", only during the opposition procedure, more precisely, during the oral proceedings in which the decision under appeal has been taken. Having regard to this factual situation, the appellant is entitled to late file new documents, with the purpose to show that such a feature was belonging to the prior art.

3. *Article 84 EPC*

The Board is satisfied that the wording of the feature: "... said guide channel extending approximately from said drive wheel (2, 2') to the rearward end of said guide strip (7, 7')", in spite of the presence in it of the adverb "approximately", cannot be considered as open to objection pursuant to Article 84 EPC. This wording, in fact, may only be construed as meaning that the guide channel extends over the whole length between the drive wheel and the rearward end of the guide strip, thereby coming so close as possible both to the drive wheel and to the rearward end of the guide strip.

4. *Novelty*

The subject-matter of Claim 1 according to the main request is novel, because none of the prior art documents under consideration discloses a gripper guide comprising all the features mentioned in said claim.

Novelty, in fact, has not been in dispute.

5. *Inventive Step*

5.1 The Closest Prior Art

Document D1 (see Figure 1), which is mentioned in the description (column 1, lines 30 to 51) of the contested patent as the closest state of the art upon which the preamble of Claim 1 is based, discloses a gripper guide for gripper weaving machines, comprising a drive wheel (3) disposed at the rear side of a gripper-bar (1) and a guide strip (6) which is extending along that same side in the direction of motion of said gripper-bar (1), wherein opposite the drive wheel (3) at the front side of the gripper-bar (1) a roller (7) is disposed in such a way that the gripper-bar (1) is held between the roller (7) and the drive wheel (3).

In the device according to D1, the gripper-bar is guided at its rear side facing the drive wheel by the guide strip and at its front side by three rollers disposed in staggered relation in the longitudinal direction of the bar. The central one of these three rollers is arranged at the opposite side of the point of mutual engagement of the longitudinal toothing of the bar and the toothing of the drive wheel so as to guarantee proper engagement. The other two rollers restrict possible bending movements of the bar in the horizontal direction away from the guide strip. These

bending movements are provoked by the drive wheel acting upon the bar to move it to and fro. This known arrangement allows rapid inspection and exchange of gripper-bars, which, due to the high speed of modern gripper weaving machines, are subject to considerable wear and therefore often have to be replaced. However, it has turned out that in operation the front and back side of the gripper-bars become uneven and the bearings of the rollers become defective after quite a short period (see column 1, lines 31 to 51 of the contested patent).

5.2 Problem underlying the invention

Therefore, with respect to the prior art device known from document D1, the problem underlying the invention is to provide a device for guiding the gripper-bars of a gripper weaving machine, which, on one hand, permits easy access to the gripper-bars for inspection and exchange and, on the other hand, extends the period of proper operation (see column 1, lines 52 to 57 of the contested patent).

5.3 Solution

According to Claim 1 of the main request, this problem is solved in that the device known from document D1 is so modified that, at the front side of the gripper-bar parallel to the guide strip, a slide strip is disposed in such a way that the gripper-bar can move to and fro between the guide strip and the slide strip, as part of an U-shaped guide channel, sliding with its front side against said slide strip, and that the slide strip is fixed opposite the guide strip by means of one or more hinges permitting easy and rapid removal of the slide strip; said guide channel extending approximately from said drive wheel to the rearward end of said guide strip.

The slide strip at the front side of the gripper-bar, cooperating with the guide strip on the opposite side of the bar, as parts of a U-shaped guide channel extending from said drive wheel to the rearward end of said guide strip, effectively reduces not only simple bending movements of the gripper-bar about a vertical bending axis in a plane containing the drive wheel axis. Both strips also further sharply reduce the higher order harmonics vibrations of the bar in a horizontal plane. This results in a considerable reduction of wear on the bar and in an increase of the operational period of the roller bearing with the further advantage that it would be sufficient to have only one of the rollers, namely the central roller on the opposite side of the driver wheel. Due to the hinge connection, the slide strip may be easily removed and reset. In this way, easy inspection and rapid exchange of the gripper-bars is possible (see column 1, line 58 to column 2, line 15, of the patent description).

5.4 For the following reasons, the above-mentioned solution is not rendered obvious by the disclosures and teachings of the prior art documents cited by the appellant.

Document D3 discloses a gripper guide device having a U-shaped guide rail for the gripper-bar. However, this guide rail is open in a direction facing away from the drive wheel, so as to ensure that the gripper-bar can be easily lifted out of the guide rail (see page 2, lines 31 to 37, Claim 1 and Figure 1, item 10', of D3). This prior art device does not restrict bending or vibrational movements of the gripper-rod in the vertical plane orthogonal to the drive wheel axis; movements which cause rapid wear and reduce operational time of the gripper device.

Therefore, the person skilled in the art could not expect from the disclosure and teaching of D3 any suggestion for the prevention of bending or vibrational movements of the gripper-bar in a direction orthogonal to the drive wheel axis; prevention which is decisive for the solution of the problem underlying the invention, i.e. "extending the period of proper operation".

The mere rotation of the axis of both the driving wheel and the U-shaped guiding channel about and angle of 90°, in order to adapt the gripper device according to D3 to double-gripper weaving machines, as proposed by the appellant, would not result in a gripper guide device according to Claim 1.

Such a rotation would not provide the feature of Claim 1 "a slide strip is fixed opposite the guide strip at the front side of the gripper-bar and opposite the drive wheel".

In order to provide such a feature, a further relative rotation about an angle of 90° of the U-shaped channel, with respect to the axis of the drive wheel, would be necessary. However, such a measure would be in contrast with the teaching of D3, demanding that the U-shaped guiding channel is **open at the top**, i.e. open in a direction orthogonal to the axis of the driving wheel and facing away from the same wheel, so that the gripper-rod can easily be lifted away from the driving wheel (see page 2, lines 31 to 37, Claim 1 and Figure 1, item 10', of D3).

Document D5 discloses a gripper guide with a horizontally extending flat guiding bar at the bottom side of the gripper-bar and with two L-shaped guiding parts at both sides of the drive wheel; said guiding parts extending from that guiding bar over the side of

the gripper-bar facing away from the drive wheel to the bottom side of the gripper-bars. These two guiding parts cannot prevent bending and vibrational movements in a horizontal plane. Furthermore, due to the relative small contact surfaces, wear and hot spots will occur.

Therefore, the person skilled in the art could not expect from the disclosure and teaching of D3 any suggestion for the prevention of bending or vibrational movements of the gripper-bar in a direction orthogonal to the drive wheel axis; prevention which is decisive for the solution of the problem underlying the invention, i.e. "extending the period of proper operation". In any case, the teaching of document D5 does not point to the provision, in the device according to document D1, of "a slide strip opposite the guide strip at the front side of the gripper-bar and opposite the drive wheel, extending approximately from the drive wheel to the rearward end of the guide strip".

Document D11, which is not concerned with high-speed gripper weaving machines but with low-speed pile-fabric producing needle looms, would not be considered by a person skilled in the art confronted with the problem of improving a gripper guiding device of a gripper weaving machine, with respect to inspection accessibility and life-time of such a device. Moreover, the supporting race-way for the needle, disclosed in D11, has a triangular cross-section which does not appear to be suitable as a guiding channel for a gripper-bar of a gripper weaving machine.

5.5 For the reasons set out above, the subject-matter of Claim 1 according to the main request involves an inventive step within the meaning of Article 56 EPC.

6. Therefore, the subject-matter of Claim 1 according to the main request constitutes a patentable invention within the meaning of Article 52(1) EPC.

The contested patent is, consequently, to be maintained in amended form according to the interlocutory decision of the opposition division.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

A. Townend

The Chairman:

A. Burkhart