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Datasheet for the decision of 5 December 2006

Case Number: T 0745/05 - 3.2.05

Application Number: 97250214.0

Publication Number: 0820865

IPC: B41F 21/00

Language of the proceedings: EN

Title of invention:
Sheet inspection apparatus for sheet-fed offset printing press

Patentee:
Komori Corporation

Opponent:
Koenig & Bauer AG

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0745/05 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 5 December 2006

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 13 April 2005 rejecting the opposition filed against European patent No. 0820865 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: W. Widmeier
Members: H. Schram
P. Mühlens

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division posted 14 April 2005 rejecting its opposition against European patent No. 0 820 865, which requested revocation of the patent as a whole, based on Article 100(a) EPC (lack of novelty, Article 54 EPC, lack of inventive step, Article 56 EPC).

II. Oral proceedings were held before the Board of Appeal on 5 December 2006.

III. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed.

IV. The following documents were in particular referred to in the appeal proceedings:

D1 EP-A 0 527 453
D8 US-A 5,368,148

V. Claim 1 of the patent in suit reads as follows:

"1. A sheet inspection apparatus for a sheet-fed offset printing press comprising: endless conveying means (5) for conveying sheets (10) delivered from a printing press unit (50), said endless conveying means having a conveying path (5b) and a return path (5a); a plurality of gripper units (7, 71, 7a, 7b, 7c, 7d), supported by said conveying means at a predetermined interval along

a sheet conveying direction, for gripping one end of a sheet, respectively; and an inspection unit (28) arranged on a side of said conveying path which opposes said return path to optically inspect a printed state of said sheet conveyed on said conveying path through said return path, characterized in that said inspection unit is positioned such that the length of a path between an inspection position (B) on said conveying path and a position (C) on said return path corresponding to a point at which a line connecting said inspection unit and said inspection position crosses said return path is an integer multiple of the interval between said gripper units, wherein said inspection unit is being adapted to inspect said sheet conveyed to the inspection position on said conveying path from a leading edge to a trailing edge within a period after a preceding gripper unit crosses the intersection on said return path unit until a next gripper unit crosses the intersection, so that optical inspection of the sheet is not impeded by the gripper units travelling on the return path."

VI. The appellant argued in writing and during the oral proceedings essentially as follows:

The subject-matter of claim 1 as granted lacked novelty with respect to document D1. This document not only disclosed a sheet inspection apparatus with all the features of the preamble of claim 1, as stated in paragraph [0005] of the patent in suit, it also disclosed the characterizing features of said claim. This followed from a proper interpretation of document D1 as a whole. Document D1 disclosed that two types of sensors 16 could be employed as inspection unit, viz. a

CCD area array image sensor and a CCD line array image sensor. Whilst the former was used to make a "snapshot" of the sheet to be inspected, the latter was used to inspect the sheet while it was being conveyed, see column 1, lines 4 to 12. The sole drawing showed the case that a CCD area array image sensor was employed. This followed from the conical scanning area 14 depicted in said picture. In this case the gripper bars on the upper gripper path conveying the sheets had to be vertically directly above the gripper bars on the lower gripper path in order not to interfere with the conical field of view of the CCD area array image sensor, see column 2, lines 14 to 23. If however a CCD line array image sensor was used, inspection of the sheet had to be a dynamic process, i.e. the sheet had to be conveyed in order to be scanned. The field of view of the CCD line array image sensor was a plane perpendicular to the upper and lower gripper bar paths. The window of opportunity for scanning the sheet started when the upper gripper bar carrying the sheet had just passed said plane from the right whereas the lower, empty gripper bar had just passed said plane from the left in the opposite direction. In this case the length of a path on the gripper path between the points where the field of view intersected the upper and lower gripper path, respectively, was an integer multiple of the interval between the gripper units. Since also the remaining characterizing features of claim 1 as granted were fulfilled, it followed that said claim was not novel, Article 54 EPC.

The subject-matter of claim 1 was also obvious to a person skilled in the art having regard to the documents D1 and D8. Document D8 disclosed a sheet

inspection apparatus wherein a sheet was checked while it passed between a lamp and a detector, see column 2, lines 46 to 58. Document D1 taught that the detector had to positioned below the lower gripper path and that interference of the gripper bars on the lower gripper path, which were not carrying sheets, and the field of view of the detector should be avoided. The combination of documents D1 and D8 thus led the person skilled in the art directly to the invention, Article 56 EPC.

VII. The respondent argued in writing and during the oral proceedings essentially as follows:

The characterizing features of claim 1 as granted were not disclosed in document D1. This document disclosed that, at the moment that the measuring impulse for the image sensor is activated, the gripper bars arranged on the upper and lower gripper path were positioned vertically directly above each other. Irrespective of the type of camera used, this arrangement clearly fell outside the ambit of claim 1. Consequently, the subject-matter of claim 1 as granted was novel, Article 54 EPC.

The subject-matter of claim 1 as granted also involved an inventive step. Since document D8 failed to disclose the incoming gripper path, it failed to disclose the location of the detector with respect to said gripper path. Document D8 did not address the problem that gripper bars could interfere with the checking operation and hence was silent about the constraint reiterated in claim 1 as granted that "the length of a path between an inspection position (B) on said conveying path and a position (C) on said return path"

was "an integer multiple of the interval between said gripper units". This constraint was also not disclosed in document D1. It followed that the subject-matter of claim 1 was not obvious with respect to documents D1 and D8, Article 56 EPC.

Reasons for the Decision

1. *Objection of lack of novelty*

1.1 Interpretation of claim 1

The sheet inspection apparatus according to claim 1 comprises "*endless conveying means having a conveying path (5b) and a return path (5a)*" and "*a plurality of gripper units (7, 71, 7a, 7b, 7c, 7d), supported by said conveying means at a predetermined interval along a sheet conveying direction, for gripping one end of a sheet, respectively*".

Sheets "*delivered from a printing press unit (50)*" are gripped by the gripper units when the return path (5a) passes the printing press unit and changes into the conveying path (5b). Whereas the grippers on the return path (5a) do not carry sheets, the grippers on the conveying path (5b) do: they convey the sheets to be inspected.

The sheet inspection apparatus further comprises (emphasis added by the Board) "*an inspection unit (28) arranged on a side of said conveying path which opposes said return path to optically inspect a printed state of said sheet conveyed on said conveying path ...,*

wherein said inspection unit is being adapted to inspect said sheet conveyed to the inspection position on said conveying path from a leading edge to a trailing edge within a period after a preceding gripper unit crosses the intersection on said return path unit until a next gripper unit crosses the intersection".

The location of the inspection unit is thus such that the grippers on the return path (5a) not carrying sheets pass through the field of view of the inspection unit directed to the inspection position on the conveying path (5b) conveying the sheets to be inspected. If however the grippers on the return path (5a) pass through the field of view of the inspection unit, defined as the line BC in claim 1, outside the period within which the sheet is inspected, optical inspection of the sheet is not impeded by said grippers. It is easily understood that the first characterizing feature, viz. "*said inspection unit is positioned such that the length of a path between an inspection position (B) on said conveying path and a position (C) on said return path corresponding to a point at which a line connecting said inspection unit and said inspection position crosses said return path is an integer multiple of the interval between said gripper units*" ensures that "*optical inspection of the sheet is not impeded by the gripper units travelling on the return path*".

The problem that gripper units travelling on the return path may impede the optical inspection of the sheet for an inspection unit having a well-defined inspection position (B) on the conveying path only occurs when the sheets are inspected while being conveyed past said

inspection position B (see column 4, lines 46 to 50, of the patent in suit).

The expressions "inspect a printed state of said sheet conveyed on said conveying path through said return path" and "to inspect said sheet conveyed to the inspection position" at the end of the preamble of claim 1 and in the characterizing part of claim 1, respectively, are thus interpreted to mean that the sheet is inspected while being conveyed.

1.2 Document D1 discloses a sheet inspection apparatus for a sheet-fed offset printing press comprising endless conveying means 9 for conveying sheets 5 delivered from a printing press unit, said endless conveying means having a conveying path (upper gripper path 12) and a return path (lower gripper path 13), a plurality of gripper units 8 supported by said conveying means at a predetermined interval along a sheet conveying direction, for gripping one end of a sheet, and an inspection unit ("Aufnahmeeinrichtung 16") arranged on a side of said conveying path which opposes said return path to optically inspect a printed state of said sheet. While the sheet is being inspected by the inspection unit 16, which can be a CCD area array or line array image sensor ("CCD-Linien- oder Flächenkamera"), it is held tightly against a suction box 2 in a crease-free alignment (see column 1, lines 42 to 51, and column 2, lines 9 to 14).

In the judgement of the Board, the sheet is thus inspected while it is held in a stationary position against the suction box 2, i.e. during inspection the sheet is not conveyed. The sole Figure shows the

conical scanning area ("Abtastkegel 14") of the inspection unit 16. When a rotary CCD line array camera is being used, the whole sheet can be scanned line by line by rotating said camera through the conical scanning area without the need to convey the sheet during scanning as suggested by the appellant.

Because the sheet is inspected while it is held in a stationary position, the grippers on the conveying path and on the return path are held stationary as well. Since there are no gripper units travelling on the return path that could interfere with the inspection of the sheet, all that is required for an unimpeded inspection of the sheet is that the gripper units are outside the conical scanning area of the inspection unit 16 during inspection. This is accomplished by positioning the inspection unit 16 opposite the middle of the sheet to be inspected, i.e. such that the gripper bars 8 arranged on the upper and lower gripper path 12, 13 are positioned vertically directly above each other as shown in the sole Figure, see column 2, lines 14 to 26.

The sheet inspection apparatus known from document D1 is thus fundamentally different from the sheet inspection apparatus as claimed in claim 1 of the patent in suit: in the former the sheet to be inspected is held stationary whereas in the latter the sheet is inspected while being conveyed. Due to this difference, the inspection units employed in the sheet inspection apparatus known from document D1 and the one according to the invention are also different: in document D1 the inspection unit has a conical scanning area whereas in claim 1 of the patent in suit the inspection unit has a

field of view corresponding to a line connecting the inspection unit and the inspection position (B).

It follows from the above that document D1 does neither disclose the feature "*inspect a printed state of said sheet conveyed on said conveying path through said return path*" at the end of the preamble of claim 1, nor the characterizing features of claim 1. None of the other documents cited by the appellant discloses a sheet inspection apparatus with all the features of claim 1. Since this has not been contested, there is no need for further substantiation.

The subject-matter of claim 1 of the patent in suit is thus new within the meaning of Article 54 EPC.

2. *Objection of lack of inventive step*

2.1 The problem which the invention seeks to solve is to provide a sheet inspection apparatus for a sheet-fed offset printing press, which allows easy adjustment and maintenance operations of the inspection unit.

This problem is solved by the subject-matter of claim 1. In particular, by arranging the inspection unit above, or below, both the conveying path and the return path of an endless conveying belt. The characterizing features of claim 1 ensure that the gripper units travelling on the return path do not interfere with the inspection operation.

2.2 Document D1 relates to a sheet inspection apparatus which utilizes a suction box with a planar lower suction surface to hold a sheet to be inspected in a

crease-free manner. Whilst this document does disclose to arrange the inspection unit below both the conveying path and the return path of an endless conveying belt, it does not address the problem of preventing the inspection operation from being impeded by gripper units travelling on the return path during the inspection operation (since the grippers are held stationary during the inspection operation), nor does this document disclose the solution to this problem as claimed in claim 1 of the patent in suit.

Document D8 discloses a device for conveying printed sheets in an installation for checking the quality of paper money, whereby a detector is used for checking transparency, see column 2, lines 46 to 58. This document also fails to address the problem of preventing the inspection operation from being impeded by gripper units travelling on the return path during the inspection operation (the return path is not shown or discussed in document D8; the detector could be located between the conveying path and the return path of an endless conveying belt, so that an interference of travelling grippers on the return path with the checking zone, i.e. a line, cannot occur).

In the judgement of the Board, the person skilled in the art, starting out from the sheet inspection apparatus according to document D1 or D8, and using common technical knowledge and/or the respective alternate document (D8 or D1), would thus not have arrived at the invention.

It follows that the subject-matter of claim 1 of the patent in suit is not obvious to a person skilled in

the art and thus involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Meyfarth W. Widmeier