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D E C I S I O N
of 23 April 1996

Case Number: T 0600/94 - 3.2.1

Application Number: 86308240.0

Publication Number: 0224333

IPC: B21B 1/02, B21J 5/00

Language of the proceedings: EN

Title of invention:
Press apparatus for reducing widths of hot slabs

Patentee:
Kawasaki Steel Corporation, et al

Opponent:
SMS Schloemann-Siemag AG

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Inadmissible extension of subject-matter (no)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0600/94 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 23 April 1996

Appellant: (Opponent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 6 June 1994 concerning maintenance of European patent No. 0 224 333 in amended form.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
G. Davies

Summary of Facts and Submissions

I. European patent No. 0 224 333 was granted on the basis of European patent application No. 86 308 240.0.

II. The granted patent was opposed by the present appellants on the basis that its subject-matter did not involve an inventive step with respect to the state of the art (Article 100(a) EPC).

In support of this objection they relied upon the state of the art represented by the following documents.

(D1) Patent Abstracts of Japan, M-151 August 24, 1982, vol.6/No.161 & JP-A-5 775 239;

(D2) EP-A-0 157 575;

(D3) Patent Abstracts of Japan, M-185 January 14, 1982, vol.7/No.9 & JP-A-57168707;

(D4) EP-A-0 112 516; and

(D5) JP-U-59 165 702.

III. With its decision given at oral proceedings on 5 May 1994, and issued in writing on 6 June 1994, the Opposition Division held that the patent could be maintained in amended form on the basis of amended claims 1 to 5 submitted on 12 April 1994.

IV. An appeal against this decision was filed on 21 July 1994 and the fee for appeal paid at the same time.

The statement of grounds of appeal was filed on 8 October 1994.

The appellants requested that the contested decision be set aside and the patent revoked in its entirety.

V. Oral proceedings before the Board were held on 23 April 1996.

At the oral proceedings the respondents (proprietors of the patent) submitted a new set of claims 1 to 5, amended pages 7 and 8 of the description and amended Figures 17 and 18 on the basis of which, together with the remainder of the description as agreed by the Opposition Division and Figures 1 to 16 as granted, they requested maintenance of the patent in amended form.

The new claims 1 and 2 read as follows:

"1. A press apparatus for reducing the width of a hot slab (7) comprising

a pair or anvils (8) movable toward and away from each other in width directions of the hot slab (7), each of said anvils (8) having a parallel portion parallel to a feeding direction of the hot slab (7) and an inclined portion on an entry side in the feeding direction;

width reduction heads (6) to which said pair of anvils (8) are attached, respectively;

eccentric driving means (2, 3) for reciprocatively driving the width reduction heads (6) through sliders (4), respectively; and

width adjusting means (5, 11, 12, 13) incorporated in the eccentric driving means (2, 3) respectively, for changing distances between the width reduction heads (6) and the sliders (4), characterised by

buckling preventing means comprising a plurality of holding means for supporting the hot slab,

a first holding means being positioned in the region along the parallel portions of the pair of anvils

(8) substantially centrally between the anvils (8), and centrally along the parallel portions,

a second holding means being positioned in the region along the inclined portions of the pair of anvils (8) and along a line connecting the rearmost points at which the slab is in contact with each anvil (8),

wherein the number of points, between and substantially equidistant from the anvils, at which the slab is held by the said buckling preventing means, is two, thereby preventing any buckling of the slab occurring during the reduction in width of slab."

"2. A press apparatus for reducing the width of a hot slab (7) comprising

a pair or anvils (8) movable toward and away from each other in width directions of the hot slab (7), each of said anvils (8) having a parallel portion parallel to a feeding direction of the hot slab (7) and an inclined portion on an entry side in the feeding direction;

width reduction heads (6) to which said pair of anvils (8) are attached, respectively;

eccentric driving means (2, 3) for reciprocatively driving the width reduction heads (6) through sliders (4), respectively; and

width adjusting means (5, 11, 12, 13) incorporated in the eccentric driving means (2, 3) respectively, for changing distances between the width reduction heads (6) and the sliders (4), characterised by

buckling preventing means comprising a plurality of holding means, for supporting the hot slab,

a first holding means being positioned in the region along the parallel portions of the pair of anvils (8), substantially centrally between the anvils (8), and substantially centrally along the parallel portions,

a second holding means being located substantially at the centre of a line connecting the centres of the

edges of the slab in contact with the inclined portions of the pair of anvils, and

a third holding means being positioned at a location opposite to that of said second holding means with respect to the line connecting the rearmost points at which the slab is in contact with the inclined portions of the anvils,

wherein the number of points, between and substantially equidistant from the anvils, at which the slab is held by the said buckling preventing means, is three, thereby preventing any buckling of the slab occurring during the reduction in width of slab."

Dependent claims 3 to 5 relate to preferred embodiments of the apparatus according to claim 1 or claim 2.

VI. The submissions made by the appellants in support of their request for revocation of the patent can be summarised as follows:

New claims 1 and 2 did not conform with the requirements of Article 123(2) EPC. In the original disclosure the position of the first, second and third holding means had been precisely defined and there was therefore no basis to be found there for the statements in the claims that these holding means were positioned "substantially centrally" between or "substantially equidistant from the anvils", or that the first holding means was positioned "substantially centrally" along the parallel portions of the anvils (claim 2). Furthermore, the terms were inherently unclear so that the claims did not comply with the requirements of Article 84 EPC.

Having regard in particular to documents D1 and D2 it would be obvious for the person skilled in the art to incorporate buckling preventing means in a press apparatus as disclosed in document D4, on which the

preamble of claims 1 and 2 was based. Document D1 specifically disclosed a single holding means positioned as required for the "first holding means" of claims 1 and 2, but suggested that further holding means as stated in the claims could be provided. Document D2 specifically disclosed in Figure 22 an arrangement with five holding means. The position of the first and last of these corresponded to the positions of the first and second holding means stated in claim 1. It was obvious for the person skilled in the art that he could simplify the known arrangement by reducing the number of holding means to two and retaining solely the first and last of those shown. Furthermore, the pinch roller shown in Figure 22 of document D2 was located at the position required for the "third holding means" as stated in claim 2. Since the pinch roller would in effect also act to prevent buckling, it was therefore apparent that the arrangement of three holding means as defined in claim 2 could also be derived in an obvious manner from this state of the art.

VII. In reply the respondents argued essentially as follows:

- It was evident to the person skilled in the art reading the original application that the positions in which the various holding means were to be located were not to be considered as precise geometrical points. This followed from the fact that the holding means themselves had finite extent. Furthermore, the original application contained explicit indications that all that was required was substantial alignment between the holding means and the precise locations given. For example, reference was made at lines 2 to 4, page 20 to a location which was "substantially at a centre of a line connecting centres of the parallel portions of the pair of anvils"; at page 22, in the last three lines,

reference was made to a location which was "substantially at a centre of the parallel portion of an anvil".

The arguments of the appellants with respect to inventive step were based purely on hindsight. Figure 22 of document D2 was merely schematic and there was no intention to show there any particular relationship between the position of the rollers and the anvils. Furthermore, the pinch roller shown there had nothing to do with preventing buckling. Present claims 1 and 2 were directed to specific arrangements of respectively only two or only three holding means. There was no even remotely comparable teaching in the state of the art.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(4) and 64 EPC. It is, therefore, admissible.

2. *Formal admissibility of the amended documents*

The single independent claim of the granted patent has been replaced by present independent claims 1 and 2. The preamble of both of these claims corresponds to the preamble of granted claim 1 and their characterising clauses have been directed to the arrangements of buckling preventing means disclosed with reference to Figures 15 and 16 respectively. The characterising clause of granted claim 1 defined the buckling preventing means in general terms which embraced both of the possibilities defined in present claims 1 and 2. There is therefore no objection to the present claims under Article 123(3) EPC.

In the opinion of the Board the person skilled in the art would understand from the originally-filed application that it was not a requirement that any of the first, second or third holding means be located exactly on a line which extended equidistantly between the anvils. It is true that a specific indication of this in the original disclosure can only be found with respect to the first holding means, see the passage at lines 2 to 4, page 20 quoted in Section VII above, but there is no technical reason why the same should not apply to the second and third holding means.

As for the statement in claim 2 that the first holding means is located "substantially centrally along the parallel portions" of the anvils, which has also been objected to by the appellants, it has to be noted that equivalent statements as to the longitudinal position of the first holding means can be found in original claim 5 and in the passage of page 22, last three lines, of the original description quoted in Section VII above. Now, it is indeed the case that neither original claim 5 nor the cited passage specifically relate to the arrangement of three holding means as set out in present claim 2. It was however clear from the original disclosure that the position of the first holding means was intended to be the same in all embodiments described there. Accordingly, there is an appropriate basis in the original application for the challenged statement.

Present claims 1 and 2 therefore conform with the requirements of Article 123(2) EPC.

The Board can also not accept that the use of the term "substantially" in the claims makes them unclear and objectionable under Article 84 EPC. In the circumstances the term merely indicates that a small variation in the

positions of the holding means is permissible provided that the technical effect achieved by them is not altered in any significant way.

Lastly, present dependent claims 3 to 5 correspond to granted claims 5 to 7 and the amendments made to the description and drawings do not go beyond what was necessary to bring these into line with the amended claims. There are therefore also no objections to these elements of the amended patent specification.

3. *Novelty and inventive step*

Of the cited prior art only document D4 discloses a width reducing press apparatus as defined in the preamble of claims 1 and 2. This known press apparatus does not comprise buckling preventing means of any form. It is therefore apparent, as has not in fact been disputed, that the subject-matter of claims 1 and 2 is novel.

As explained in the patent specification buckling of the slab being pressed by the apparatus known from document D4 is liable to occur especially when the amount of width reduction being employed is relatively large. It is the aim of the present invention to prevent such buckling. As illustrated with particular reference to Figures 1 and 14 the nature of the buckling which occurs differs according to which type of pressing operation is being performed, for example pressing a preformed leading slab end, steady pressing along the length of the slab, or pressing a preformed trailing slab end. In order to prevent buckling in all possible situations while at the same time avoiding a complex structure for the buckling preventing means the patent specification proposes two alternative arrangements. The first, as set out in present claim 1, comprises only two

holding means (e.g. rollers) and the second, as set out in present claim 2, comprises only three holding means. In both cases the position of the holding means is defined by reference to the parallel and inclined portions of the anvils of the press and the region of contact between the slab and these inclined portions.

Document D2 is also concerned with a width reducing press apparatus having press anvils with respective inclined and parallel portions. It is particularly concerned with the angle of inclination of the inclined portions which should be used if various forms of unwanted deformation at the ends of the slab are to be avoided. In Figure 22 a press apparatus is shown which comprises a buckling preventing device. This device is named in the description of Figure 22 but not further defined. From the figure, which is of very schematic nature, it would appear to comprise five rollers arranged one after the other with the first (downstream) positioned in the region between the parallel portions of the anvils and the last (upstream) between the inclined portions. Given the character of Figure 22 the Board is of the opinion that it would be inappropriate, as attempted by the appellants, to try to derive therefrom any teaching as to the actual positions of the first and last holding means in the longitudinal direction of the slab. In any case, contrary to what has been asserted by the appellants, it is apparent that as shown in the Figure the first holding means is not positioned centrally or even "substantially" centrally along the parallel portions of the anvils, as is required by the claims.

Furthermore, with respect to present claim 1, it is not clear to the Board why the person skilled in the art would depart from the arrangement of five holding means shown in Figure 22 of document D2 and move to an

arrangement of only two holding means, and if he did so to locate these at the positions of the first and last holding means. In this respect the appellants referred to document D1 as teaching the person skilled in the art that he is free to use as many holding means as he thinks appropriate. The Board can, however, find no such teaching in this document. The reference there to "press rolls" in the plural would appear to be merely related to the fact that a pair of rolls, one below and one above the slab, are used.

Similar considerations apply to the subject-matter of present claim 2. Here, the appellants have equated the upstream pinch roller shown in Figure 22, which is used for feeding the slab, to holding means for preventing buckling and asserted that its position corresponds to that of the third holding means defined in the claim. The Board can, however, find no cogent reasons why the person skilled in the art, even if he were to choose an arrangement with three holding means, would position the third of these at the position of the upstream pinch roller shown in Figure 22 of document D2 and the other two at the two positions specified in claim 2, neither of these positions being taught per se by this prior art.

Documents D3 and D5 concern vertical rolling mills and are less relevant than the documents considered above. They do not need to be considered further here.

Having regard to the above the Board comes to the conclusion that the subject-matter of claims 1 and 2 cannot be derived in an obvious manner from the state of the art and accordingly involves an inventive step

(Article 56 EPC). These claims, together with dependent claims 3 to 5 and the revised description and drawings therefore form a suitable basis for maintenance of the patent.

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 5 filed during the oral proceedings;

   Amended pages 7 and 8 of the description filed during the oral proceedings, remainder of the description as agreed by the Opposition Division;

   Figures 1 to 16 as granted, Figures 17 to 18 as filed during the oral proceedings.

The Registrar: The Chairman:

S. Fabiani F. Gumbel