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D E C I S I O N
of 28 March 2000

Case Number: T 1214/97 - 3.2.3
Application Number: 90101115.5
Publication Number: 0438607
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C10M 169/04

Language of the proceedings: EN

Title of invention:
Coiled steel strip with solid lubricant coating

Patentee:
Inland Steel Company

Opponent:
Hoogovens Staal BV

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - problem and solution"

Decisions cited:
-

Catchword:
-



Case Number: T 1214/97 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 28 March 2000

Appellant: Hoogovens Staal BV
(Opponent) Wenckebachstraat 1
NL-1951 JZ Velsen-Noord (NL)

Representative: Herman de Groot, Johan Willem
Hoogovens Corporate Services BV
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Respondent: Inland Steel Company
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Representative: Leach, John Nigel
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 22 October 1997
rejecting the opposition filed against European
patent No. 0 438 607 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
M. Aúz Castro

Summary of Facts and Submissions

I. European patent No. 0 438 607 was granted with claims 1 to 16 on 13 September 1995.

II. The independent claims read as follows:

- "1. A coil of pre-lubed steel strip, said strip comprising:
- a steel strip substrate;
 - and a uniform coating of lubricant on each surface of said substrate; characterised in that said coating comprises a solid lubricant and has a coating weight greater than 20 mg/ft.² (0.22 g/m²) for lubricity purposes and less than 100 mg/ft.² (1.08 g/m²) to prevent slippage during operations incident to the blanking of the coiled strip; and
- said coating has a needle penetration hardness number in the range 9-250."

and

- "9. A blanking procedure for converting, into blanks, a coil of pre-lubed steel strip having a steel substrate with both surfaces covered with a uniform coating of lubricant, characterised by a method for preventing slippage during metering and levelling operations incident to said blanking procedure, said method comprising:
- providing said uniform coating as a solid lubricant and limiting said solid lubricant on the coiled strip to a coating weight greater than 20 mg/ft.² (0.22 g/m²) and less than 100 mg/ft.² (1.08 g/m²); and

said coating has a needle penetration hardness number in the range 9-250."

- III. According to granted claims 2 and 10 the coating weight is greater than 50 mg/ft² (0.54 g/m²).
- IV. With decision of 22 October 1997 the opposition division rejected the opposition of Hoogovens Staal BV - appellant in the following - pursuant to Article 102(2) EPC.
- V. The appellant appealed this decision on 18 December 1997 paying the appeal fee on the same day and filing the statement of grounds of appeal on 2 March 1998.
- VI. Following the board's communication of 21 September 1999 in which the board dealt with the following documents
 - (D3) Society of Automotive Engineers, Technical Paper No. 870 648, 23rd February 1987, Phillip L. Coduti: "Tribological Behavior of Solid Lubricant Films on Bare and Coated Sheet Steel Products" (already cited during the examination procedure);
 - (D4) US-A-4 191 658;
 - (D5) EP-A-0 043 182 and
 - (D7) Phillip L. Coduti: "The Production and Implementation of Prelubricated Cold Rolled Steel", Lubrication Engineering, Volume 42, No. 9, 1986, pages 532-538

oral proceedings were held on 28 March 2000 in which the patentee - respondent in the following - filed an auxiliary request according to which the independent claims were restricted to a lower limit of 50 mg/ft² (0.54 g/m²), and the appellant and the respondent essentially argued as follows:

(a) appellant

- the nearest prior art document is (D3) which is based on solid lubricants to be applied on a coil of steel strip whereby in Figure 5 thereof the interrelationship between hardness and content of solids in the lubricant is discussed;
- with respect to granted claim 1 it has to be observed that the coating only "comprises" a solid lubricant;
- the combination of (D3) with further documents such as (D4), (D5) and (D7) renders obvious the claimed subject-matter, since the interrelationship between the quantity of lubricant and slippage was known to the skilled person, namely in that too little lubricant can lead to dry spots on the steel strip and too much lubricant leads to waste of material, slippage and not necessarily to a higher degree of lubrication;
- further relevant prior art is also seen in

(D8) US-A-4 753 743 (cited in EP-B1-0 438 607)
and

(D9) "Improvement of Press Formability of
Precoated Sheet Steels by Lubricant FABTECH
INTERNATIONAL '89, held October 9 to 12,
1989, Rosemont, Illinois

since (D8) discloses a hardness within the claimed range of granted claim 1 and the information that excess lubricant, if any, may be removed, (see Example 2), and since (D9), see its abstract and remark 3.2, deals with the application of solid lubricants and their thickness and hardness whereby it is taught that a thickness of 0.5 g/m² is optimum;

- respondent's argument of an ex post facto analysis is therefore not justified since nothing has to be interpreted in the light of the claimed invention rather can directly be derived from the prior art;
- under these circumstances the patent has to be revoked.

(b) respondent

- it is not admissible to pick out specific features from several pieces of prior art since claim 1 as granted is based on a combination of features so that the problems of excess lubricant are overcome;
- without the exercise of an ex post facto analysis a skilled person cannot derive from the prior art useful hints to achieve the claimed subject-matter since an incentive to consider pieces of prior art in combination cannot be seen;

- trial and error is not a reliable basis for achieving the claimed subject-matter;
- (D7) for example relates to liquid lubricants and leads away from the claimed invention since it is taught to overcome the problems of slippage mechanically;
- (D3) relates to small test samples coated with solid lubricants (see page 2, right column) without, however, leading a skilled person to the solution of how slippage in combination with a pre-lubed strip can be avoided;
- only by hindsight could a skilled person jump from document to document without even then necessarily arriving at a point to limit the amount of lubricant to exclude the existence of slippage;
- the claimed invention is therefore not only novel but also inventive.

VII. The appellant requested that the decision under appeal be set aside and that the European patent No. 0 438 607 be revoked.

VIII. The respondent requested that the appeal be dismissed, by way of auxiliary request, with the proviso that the patent be maintained on the basis of claims 1 to 14 filed at the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. *Novelty*

The issue of novelty was not disputed by the appellant and the board so that no detailed arguments are necessary in this respect.

3. *Inventive step*

3.1 Nearest prior art document is (D3) which document teaches the application of **solid** lubricants on sheet steel in the form of a coil, see page 12 and paragraphs headed "Potential benefits", whereby a needle penetration hardness of 9 is achieved in the example dealt with on page 3, right column, fifth paragraph of (D3).

3.2 According to page 6, right column, second paragraph of (D3) the whole range between "zero percent solid lubricant (i.e., 100% liquid lubricant) to 100% solid lubricant was examined". The interrelationship of % solid and hardness is disclosed in Figure 5 of (D3) whereby 100% solid equals a hardness of "9" and already 30% solid equals a hardness of "262" i.e. completely covering the range for the needle penetration hardness number of granted claim 1. Examining the **whole range** of solids content in (D3) clearly means that the skilled person automatically obtains hardnesses between 9 and 250 as claimed.

3.3 In (D3) coating weights up to $2.18 + 0.27 \text{ g/m}^2$ are described (see page 3, right column, paragraph 5) which according to EP-B1-0 438 607, column 1, line 55 to column 2, line 4, leads to **slippage** of the strip at the

metering/levelling rollers. Slippage between the strip and metering rollers causes wrong signals in combination with the metering rollers so that the length of a moving strip is not correctly sensed.

- 3.4 This detrimental effect of the known coating weight according to (D3) will be realized by a skilled person when using a strip coated in this way without knowing the claimed invention.
- 3.5 Confronted with this situation a skilled person would seek to overcome the shortcomings of too much lubricant on the strip so that this problem has to be seen as the **objectively** remaining problem to be solved by a skilled person starting from the nearest prior art document (D3).
- 3.6 It could be argued that the only not-novel feature of granted claim 1 with respect to the nearest prior art (D3), namely reducing the excessive coating weight causing slippage in use of the pre-lubed strip, **would** (not only could) be solved by a practitioner by investigating the background of slippage, immediately being aware that an excess quantity (thickness) of lubricant is the source of unwanted slippage and deriving therefrom that it is only necessary to reduce the lubricant-thickness until the detrimental effect of slippage is excluded.

Under these circumstances **trial and error** automatically lead to the result that the lubricant thickness on the strip has to be restricted to values as in granted claim 1 without the exercise of an inventive endeavour.

The above chain of considerations clearly overcomes

respondent's argument of an interpretation of the prior art knowing the claimed invention and of picking out features from different pieces of prior art to arrive at the subject-matter of granted claim 1.

3.7 Even if the above approach is neglected the subject-matter of granted claim 1 lacks inventive step for the following reasons:

3.7.1 Being confronted with the pre-lubed strip according to (D3) and its properties, namely its tendency to cause slippage at the metering and levelling rollers, it can be assumed that a skilled person aware of this situation considers further prior art documents, for example (D4), (D5) and (D7), to get more information about the problem of slippage and how it can be solved. The appellant essentially addressed inter alia (D4) in this respect and deduced that this document in combination with (D3) renders obvious the subject-matter of granted claim 1.

3.7.2 As clearly dealt with in the board's communication pursuant to Article 11(2) RPBA under remarks 6.3 and 6.4 (D4) has as its purpose to provide a non-slippery and solid film on a strip, see column 1, line 63 to column 2, line 3, or see column 7, line 66 to column 8, line 2 of (D4). In this context "feeding of blanks" and "material handling" are expressly addressed in (D4), see for instance column 1, lines 42 to 46. In combination with the information given on column 10, lines 18 to 20, of (D4), namely that the "film thickness may also be regulated by the use of..." it is evident that a skilled person considering (D4) is pushed to reducing any excessive amount of solid lubricants **until no slippage** on any rollers is

observed. Even if (D4) is silent about specific values for an optimum lubricant-thickness a skilled person is clearly taught by (D4) to reduce the film thickness until slippage is no longer existent; this teaching **automatically** leads at least to the upper limit for the film thickness of granted claim 1, namely 1.08 g/m².

- 3.7.3 It has to be added that (D5) immediately addresses in its page 14, second paragraph, a range for the lubricant thickness from 0.22 to 0.88 g/m² i.e. nearly identical with granted claim 1.
- 3.7.4 Starting from (D3) and considering further pieces of prior art, for instance (D4) and/or (D5), directly leads a skilled person to the subject-matter of granted claim 1 so that the requirements of Articles 56 and 100(a) EPC are not fulfilled.
- 3.7.5 Contrary to respondent's findings the above chain of arguments is not an assessment of the prior art by an ex post facto analysis, nor cannot be seen as simply picking out individual features known per se from different pieces of prior art since the effect of slippage in combination with pre-lubed strips is directly dealt with in (D4) and partly in (D7).

Again the respondent's argument with respect to (D7), namely that a skilled person would be pushed by page 537, third paragraph ("It is imperative that line builders...") to a **mechanical** solution of the problem of slippage, does not exclude the application of a "squeegy or similar device" (see (D8), column 8, lines 30 to 32) to reduce the film thickness of the lubricant to a range in which slippage does not occur and in which dry spots on the strip are avoided.

- 3.7.6 Since (D4) and (D7) also deal with the problem of slippage there clearly existed an incentive for a skilled person to consider these documents. Even if in (D7) oil-base lubricants, see page 533, second paragraph, are mentioned it may not be derived therefrom that claim 1 as granted differs in this respect since this claim clearly defines the coating with the words "**comprises** a solid lubricant" (stress added) and since the hardness range claimed, namely from 9 to 250, clearly covers the complete range from "liquid to solid", see (D3) and its Figure 5.
- 3.7.7 From the above considerations follows that granted claim 1 is not valid and cannot serve as a basis for maintenance of EP-B1-0 438 607.
- 3.7.8 Since the teaching of granted claim 9 is clearly related to granted claim 1 it is not necessary to give detailed arguments for claim 9. Claim 9 as granted does therefore also not define patentable subject-matter within the meaning of Articles 56 and 100(a) EPC and is not valid likewise.

Auxiliary request

4. Claims 1 and 8 are the independent claims of this request and are restricted to a lower limit of 50 mg/ft² (0.54 g/m²) as disclosed in granted claims 2 and 10. The requirements of Articles 123(2) and (3) EPC are therefore clearly met with respect to the **auxiliary request**.
5. Novelty was again not disputed in the oral proceedings so that the crucial issue to be decided is inventive step.

6. Since the only distinguishing feature with respect to granted claims 1 and 9 of claims 1 and 8 of the **auxiliary request** is the lower limit of the film thickness most of the above arguments with respect to the **main request** are also applicable for the **auxiliary request**. From (D9), see remark 3.2, a film thickness of 0.5 g/m² is disclosed as being "the optimum lubricant film thickness". Under these circumstances claims 1 and 8 of the **auxiliary request** do not add anything inventive to the non-allowable **main request**, Articles 56 and 100(a) EPC. Claims 1 and 8 of the **auxiliary request** are therefore also not valid.

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:

A. Counillon

C. T. Wilson