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D E C I S I O N
of 4 April 2003

Case Number: T 0335/01 - 3.2.7

Application Number: 94117158.9

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IPC: B65G 17/08

Language of the proceedings: EN

Title of invention:
High friction plastic conveyor belts having modular links formed by two integrated plastic materials

Patentee:
Laitram L.L.C.

Opponent:
MCC Nederland B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0335/01 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 4 April 2003

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 22 January 2001 revoking European patent No. 0 654 426 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: A. Burkhart
Members: K. Poalas
J. H. P. Willems

Summary of Facts and Submissions

I. The appellant (patent proprietor) lodged an appeal against the decision of the Opposition Division on the revocation of the European patent No. 0 654 426.

Opposition was filed against the patent as a whole based on Article 100(a) EPC on the grounds of lack of novelty (Article 54 EPC) and lack of inventive step (Article 56 EPC).

The main request of the patent proprietor during the opposition proceedings was the rejection of the opposition. As a first auxiliary request an amended claim 1 was filed on 17 November 2000 and as a second auxiliary request a further amended claim 1 was filed during the oral proceedings on 14 December 2000.

The Opposition Division found that the subject-matter of claim 1 of the main and the auxiliary requests lacked an inventive step and prejudiced the maintenance of the patent, having regard to following documents:

D5: "Haftvermittlerfreie Kunststoff/Kautschuk-Verbundsysteme", Kautschuk-Gummi Kunststoffe 42, No. 9, published September 1989,

D6: "Spritzschweissen", W. Pfleger, Domat/EMS, published December 1992,

D10: EP 0 523 810 A, and

D13: DE 85 24 813.4 U.

II. The appellant requested that the decision under appeal be set aside and the patent be maintained on the basis of the amended description and claims as submitted on 14 January 2003. Amended claim 1 corresponds to the first auxiliary request as filed on 17 November 2000 during the opposition proceedings. As an auxiliary measure, oral proceedings were requested.

III. The respondent requested that the appeal be dismissed. With the fax received on 11 June 2002 the respondent stated that he "will no longer take part in the appeal proceedings regarding the decision of the Opposition Division to revoke the European Patent 0 654 426".

IV. Claim 1 reads as follows:

"A modular link for a conveyor belt formed of a plurality of the modular links pivotably coupled end-to-end by pivot rods passed through interdigitated link end fingers (18), said link being formed of a hard plastic material base element (12) having a low coefficient of friction and presenting a rigid high strength flat load conveying surface (15) for the conveyor belt and carrying a high friction resilient surface material (11) in contact therewith to outwardly extend from said load conveying surface (15) of said hard plastic material over a substantial portion of the flat load conveying surfaces (15, 50) thereby forming an integral body (53, 54, etc.) therewith, said surface material (11) presenting a patterned surface having a resiliency that gives with the weight of load bodies in contact therewith being conveyed by said belt, said surface material (11) being a soft thermoplastic rubber like material thermally bonded over its entire contact surface with the hard plastic material (12) onto said

hard plastic material (12) by thermal injection molding (21, 22, 23)".

V. The appellant argued essentially as follows:

The Opposition Division and the respondent relied on hindsight and an improper characterization of the truly skilled man at the time the application was filed. The skilled man would not have been familiar with both documents D6 and D10. The man skilled in conveyor belt design and construction would have to undertake an inventive step by using a thermal injection molding technique, even if such technique was known in other fields distant to conveyor belt construction. Document D10 does not discuss incompatibility of gluing rubber with plastic materials by bonding parts over their whole contact surface. Apparently document D10 speaks of using welding or gluing techniques, but only locally and never over the whole contact surface.

Thermal bonding requires special molding techniques and tools that can be quite expensive and was unfamiliar to plastic belt manufacturers at the time the application was filed. It is not clear that the inventor in document D10 would opt for thermal injection molding over his local ultrasonic welding. He could use a standard, familiar molding process to produce his module and, then, in a secondary operation, mold the high-friction pad to each module.

For these reasons the subject-matter of claim 1 of the patent in suit met the requirements of Article 56 EPC.

VII. The respondent and the Opposition Division argued essentially as follows:

The only reason for the skilled person not to bond the surface material directly to the hard plastic material of the modular link of document D10 was the material incompatibility.

It is clear to the person skilled in the art that the frame of document D10 is an auxiliary means which the skilled person would consider to dispense with in the favour of alternative possibilities and - in view of the objective problem to be solved with respect to document D10 - would seek to dispose with.

Document D6 shows that such alternative possibilities were available at the priority date. According to document D6, different polyamide-based "hard" materials can be bonded with resilient materials by thermal injection molding. Document D6 does not only relate to leisure equipment, but also to mechanical engineering as well as automobile and electrical industries. The skilled person would therefore consider using the teaching of document D6 for the material bonding by producing a modular link having a pad according to document D10, without using a frame, since the frame is what the skilled person seeks to avoid.

The skilled person in the fields of conveyor chains and plastics may be the same person and this person would combine the teachings of documents D10 and D6 and arrive at the subject-matter of claim 1 without exercising inventive skill.

Document D5 relates to the bonding of relatively flexible plastic materials to relatively rigid plastic materials. It describes particular thermoplastic material combinations which can be joined without any

use of intermediate substances by means of thermal injection moulding. Amongst the possible fields of use the substitution of rubber on metal combinations in conveyor belt elements is listed. This is a clear suggestion to the skilled person knowing document D13, which discloses a metal link with a rubber pad and from which the subject-matter of claim 1 differs in that the base element is formed of a hard plastic material and the high friction resilient surface material is bonded thereto by thermal injection moulding, to manufacture the link known from document D13 by using the method known from document D5. The skilled person would thus arrive at a modular link according to claim 1 of the patent in suit without employing inventive skill.

Reasons for the Decision

1. *Amendments and Novelty - Articles 123(2), 123(3) and 54 EPC*

In the decision of the opposition division it was concluded that the first auxiliary request fulfils the requirements of Articles 123(2), 123(3) and 54 EPC.

The present main request corresponds with the first auxiliary request of the opposition proceedings, and therefore the grounds given in the opposition division's decision are still valid.

The Board does not see any error or inconsistency in these reasons and adopts it as part of its decision in respect of amendments and novelty.

Therefore, the requirements of Articles 123(2), 123(3)

and 54 EPC are met.

2. *Inventive step - Article 56 EPC*

2.1 Closest prior art

The closest prior art is represented by document D10 (see claim 4 and column 2, line 35 to column 3, line 24), which discloses a modular link 13 for a conveyor belt 10 formed of a plurality of modular links pivotably coupled end-to-end by pivot rods 14 passed through interdigitated link end fingers, said link being formed of a hard plastic material base element having a low coefficient of friction and presenting a rigid high strength flat load conveying surface for the conveyor belt and carrying a high friction resilient surface material 17 in contact therewith to outwardly extend from said load conveying surface of said hard plastic material over a substantial portion of the flat load conveying surface thereby forming an integral body therewith, said surface material 17 presenting a patterned surface having a resiliency that gives with the weight of load bodies in contact therewith being conveyed by said belt, said surface material being a soft thermoplastic rubber like material.

According to document D10 said surface material 17 is connected by molding to a frame 16 made of material compatible for the purpose of stable connection with the base element and then said frame being fixed to said base element by gluing or welding.

2.2 Problem underlying the invention

The problem underlying the invention of the patent in

suit is to provide a less complicated method to manufacture high friction modular links for a conveyor belt (see column 1, lines 32 to 34 of the patent in suit).

2.3 Solution

The above mentioned problem is solved according to claim 1 in that the soft thermoplastic rubber like surface material is thermally bonded over its entire contact surface with the hard plastic material onto said hard plastic material by thermal injection molding.

2.4 This solution is not rendered obvious to the person skilled in the fields of conveyor belts and plastic materials by the documents under consideration for the following reasons:

Document D10 relates to the same problem as the patent in suit, since at column 1, lines 38 to 44 of document D10 it is stated that the object of document D10 is to provide a relatively simple to manufacture high friction link conveyor belt.

This object is achieved in document D10 by providing a frame of material enabling a stable connection with the material of the link base element, said frame having at least on top undercut seats and on these being molded a yielding material filling said seats, the frame being fixed to the base element by gluing or welding.

The person skilled in the art starting from document D10 and seeking to solve the problem of the patent in suit being identical with the problem mentioned in

document D10 finds no incentive in document D10 to use thermal injection molding for fixing rubber pads directly onto the link base elements. On the contrary, document D10, see column 1, lines 16 to 26 dissuades the skilled person from molding the rubber pads directly onto the link base elements.

Document D6 discloses the information that different polyamide-based "hard" materials can be bonded to resilient materials by thermal injection molding. Document D6 mentions also different application fields for such bonded products, some of those being in the field of automobiles and electrical industries.

However, there is no hint in document D6 for the person skilled in the art to dispense with the frame which according to document D10 is a necessary element for fixing the yielded material to the base element of the modular link.

Therefore, the combination of the teachings of documents D10 and D6 does not incite the person skilled in the art to modify the modular link known from document D10 in the sense that the frame is dispensed with and the soft thermoplastic rubber like material is directly bonded onto the flat loading surface of the hard plastic material base element using thermal injection molding.

Also the combination of the teachings of documents D13 and D5 does not render obvious the subject-matter of claim 1 of the patent in suit for the following reasons:

Document D13 seeks to provide an improved link for a

stable conveyor belt having a high loading capacity. In order to achieve this target, document D13 proposes that a known conveyor belt link made of polyamide, ie of hard plastic material, having a low load-bearing capacity and a low wear resistance, should be replaced by a modular link having a steel plate with a rubber pad vulcanised thereon.

Document D5 provides the general teaching that in the field of conveyor band elements relatively flexible thermoplastic materials can be connected to relatively rigid thermoplastic materials by thermal injection molding.

Since the skilled person learns from document D13 not to use a conveyor belt link consisting of polyamide plates, ie of hard plastic material, and to use instead of that a steel plate as base element of such a link, he would not apply the teaching of document D5 to a conveyor belt link known from document D13, since the conveyor belt link according to document D13 must have a steel base element in order to obtain the required high load-bearing capacity.

2.5 For the above-mentioned reasons, the subject-matter of claim 1 of the patent in suit involves and inventive step within the meaning of Article 56 EPC.

2.6 The same applies to the subject-matter of dependent claims 2 to 18, which define further embodiments of the subject-matter of claim 1.

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 in amended form on the basis of the following documents:

claims: 1 to 18 filed on 14 January 2003,

description: columns 1 to 5 filed on 14 January 2003,

Figures: 1/3 to 3/3 of the patent as granted.

The Registrar: The Chairman:

D. Spigarelli A. Burkhart