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Datasheet for the decision of 12 September 2013

Case Number: T 1605/11 - 3.2.07

Application Number: 06799479.8

Publication Number: 1940707

IPC: B65G 17/08

Language of the proceedings: EN

Title of invention:
Conveyor Chain

Applicant:
Rexnord Flattop Europe B.V.

Headword:
-

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

Keyword:
"Amendments (allowable)"
"Inventive step: yes"

Decisions cited:
-

Catchword:
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Case Number: T 1605/11 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 12 September 2013

Appellant: (Applicant)	Rexnord Flattop Europe B.V. Einsteinstraat 1 NL-2691 GV 's-Gravenzande (NL)
Representative:	Hatzmann, Martin V.O. Johan de Wittlaan 7 NL-2517 JR Den Haag (NL)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted 30 December 2010 refusing European patent application No. 06799479.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: H. Meinders
Members: K. Poalas
E. Kossonakou

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal against the decision of the Examining Division refusing European patent application 06 799 479.8.

II. In its decision, the Examining Division held that the subject-matter of claims 1 and 6 filed with letter dated 16 September 2009 does not involve an inventive step (Article 56 EPC) over the teaching of:

D1 ("MCC modular conveyor components" catalogue, November 1995 (1995-11), pages 1 to 3)

in combination with the customary practice followed by the person skilled in the art including the simple reduction of specific dimensional parameters of the chain and the chain link known from D1.

III. Oral proceedings before the Board took place on 12 September 2013. The appellant requested at the end thereof that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:

description:	pages 1 and 3 to 6 of the application as filed, and page 2 as filed at the oral proceedings;
claims:	1 to 6 filed as main request at the oral proceedings;
figures:	1A to 1C and 2A to 2C of the application as filed.

IV. Independent claims 1 and 3 read as follows:

"1. A stainless steel sheet metal chain link (2), comprising a basically rectangular conveying body part (3) and a hinge assembly (4) located below the conveying body part, which hinge assembly (4) comprises a centrally located hinge loop (7) on one longitudinal side (8) of the conveying body part (3) of the chain link (2), and a pair of hinge loops (10) spaced apart with an intermediate distance (9) on the opposite longitudinal side (11) of the chain link (2), and wherein the width of the hinge assembly (40 (*sic*) on the first longitudinal side (8) is between 41 mm and 43 mm, wherein: the hinge assembly (4) further comprises two auxiliary hinge loops (12), each located, with a second intermediate space (13), next to the central loop (7) on the longitudinal side (8) of the conveying body part (3) of the chain link (2);
wherein the thickness of the sheet metal of the conveying body part (3) is 2.5 mm and wherein the inside diameter of the hinge loops (7, 10, 12) is 4.0 mm, and wherein the pitch between the hinge loops (7, 10, 12) on the opposite longitudinal sides (8, 11) is 1 inch (25.4 mm)".

"3. A conveyor chain (1), comprising a series of stainless steel sheet metal chain links (2) according to any of the preceding claims, wherein the central loop (7) is located in the intermediate space (9) of a successive chain link (2), while the pair of hinge loops (10) of a preceding link (2) are each located in a second intermediate space (13), wherein the cooperating hinge loops (7, 10, 12) of successive links (2) are connected

by means of hinge pins (14), and wherein the diameter of the hinge pin (14) is 4.0 mm".

V. The appellant argued essentially as follows:

The specific values of 2.5 mm for the thickness of the conveying body part, of 4.0 mm for the inside diameter of the hinge loops and of 1 inch (25.4 mm) for the pitch between the hinge loops as claimed in claim 1 are sufficiently far removed from the corresponding values of 3.15 mm, 6.35 mm and 1.5 inch (38.1 mm) known from D1 for both the wide and the narrow type of chain link such that they cannot be considered the result of a simple trial-and-error process. To achieve such an important reduction in material it is required that an inventive activity be exercised.

Thus, whether starting from a single hinge chain link as depicted on page 2 of D1 or from a double hinge chain link depicted on page 3 of D1 the person skilled in the art would not arrive in an obvious manner at the chain link claimed in claim 1. Indeed, the chain link of page 2 of D1 represents the proper prior art to start from.

The same finding concerning inventive step applies also to the conveyor chain according to claim 3 since said chain comprises a series of chain links according to claim 1.

Reasons for the decision

1. *Amendments - Article 123(2) EPC*

1.1 Claim 1 corresponds to the combination of the originally filed claims 10, 11, 12 and 13 together with the information disclosed on page 3, line 11 of the originally filed description where it concerns the use of stainless steel sheet material for the chain links. Claim 2 corresponds to the originally filed claim 15. Claim 3 corresponds to the combination of the originally filed claims 1, 2, 3 and 6 together with the information disclosed on page 3, line 11 of the originally filed description where it concerns the use of stainless steel sheet material for the chain links. Claims 4 and 5 correspond to the originally filed claims 4 and 5 and claim 6 corresponds to the information disclosed on page 5, lines 24 to 28 of the originally filed description.

1.2 The Board considers therefore that claims 1 to 6 filed as main request during the oral proceedings meet the requirements of Article 123(2) EPC.

The same applies to the amendments on page 2 of the description to concur with the amended wording of claim 1.

2. *Claim 1 - Inventive step, Article 56 EPC*

2.1 *Closest prior art*

2.1.1 The single hinge chain link shown on page 2 of D1 is considered by the appellant as representing the most

appropriate prior art to start from.

Said chain link comprises a basically rectangular conveying body part and a hinge assembly located below the conveying body part, which hinge assembly comprises a centrally located hinge loop on one longitudinal side of the conveying body part of the chain link, and a pair of hinge loops spaced apart with an intermediate distance on the opposite longitudinal side of the chain link, wherein
the width of the hinge assembly on the first longitudinal side is 42.1 mm;
the thickness of the sheet metal of the conveying body part is 3.15 mm;
the inside diameter of the hinge loops is 6.35 mm; and
the pitch between the hinge loops on the opposite longitudinal sides of the conveying body part is 1.5 inch (38.1 mm).

2.2 *Differentiating features*

The chain link according to claim 1 differs from the above-mentioned chain link in that
the hinge assembly further comprises two auxiliary hinge loops, each located, with a second intermediate space, next to the central loop on the longitudinal side of the conveying body part of the chain link;
the thickness of the sheet metal of the conveying body part is 2.5 mm;
the inside diameter of the hinge loops is 4.0 mm; and
the pitch between the hinge loops on the opposite longitudinal sides is 1 inch (25.4 mm).

2.3 *Effect*

The above-mentioned differentiating features establish reduced structural dimensions of the chain link und thus result in reduced material costs. The Board considers, in agreement with the appellant, that the reduced material costs are indeed obtained with only a small concession as to load bearing capacity, see lines 6 to 9 of description page 2 as originally filed.

2.4 *Inventiveness*

2.4.1 The Board agrees with the appellant that there are many factors that play a role in designing a conveyor chain and its chain links, and that these factors interrelate in a complex way, in particular when striving for the minimum in material costs while still achieving maximum tensile load and sufficient stability, as done with the above-mentioned specific values for the sheet material thickness, inside diameter of the hinge loops and the pitch, see point 2.2. For example, the maximum tensile load depends inter alia on the inner diameter of the hinge loops which not only defines the diameter available for the hinge pin, but also influences the maximum moment at the hinge before it starts to bend open. The width of the hinge assembly, the location and the number of the hinge loops define inter alia the bending moment exerted on the hinge pin. The width and the number of hinge loops together with the thickness of the chain link define inter alia the area available to transfer tensile forces. The width of the hinge assembly, the number of hinge loops and the thickness of the chain link play also a role in the calculation of the maximum bending moment. The material thickness

plays a further role in defining the weight of the chain, and thus also influences the maximum tensile load capacity of the chain.

2.4.2 The Board is satisfied that due to the complexity of the interrelations between the plurality of dimensional parameters of the chain link, there is in claim 1 more at stake than a mere downsizing of specific dimensions of the chain link as a result of a straightforward trial-and-error process. Indeed, the specific values of 2.5 mm for the thickness of the conveying body part, of 4.0 mm for the inside diameter of the hinge loops and of 1 inch (25.4 mm) for the pitch, lie sufficiently far away from the corresponding values of 3.15 mm, 6.35 mm and 1.5 inch (38.1 mm) known from D1 for the single hinge chain link depicted on page 2, such that they cannot be considered the simple result of the application of standard technical skills.

2.4.3 D1 is a catalogue for modular conveyor components depicting further on page 3, a double hinge chain having a width of the hinge assembly of 80.3 mm for running within a large width (82 mm) track.
One would at most imagine that the skilled person would be contemplating the redesign of the single hinge version into a double hinge version, if a stronger hinge is needed, while maintaining the smaller width. However, this does not automatically entail the present far-reaching reduction in chain link thickness, inside diameter of the hinge loops and pitch.

2.4.4 For the above-mentioned reasons the chain link according to claim 1 involves an inventive step over the single hinge chain link known from page 2 of D1.

2.5 *Further appropriate state of the art*

2.5.1 The Board, for the sake of argument, considers the double hinge chain link depicted on page 3 of D1 as representing also an appropriate state of the art, i.e. an appropriate starting point for assessing inventive step for the subject-matter of claim 1.

2.5.2 The chain link according to claim 1 differs from the chain link depicted on page 3 of D1 in that
the width of the hinge assembly on the first longitudinal side is 42.1 mm;
the thickness of the sheet metal of the conveying body part is 2.5 mm;
the inside diameter of the hinge loops is 4.0 mm; and
the pitch between the hinge loops on the opposite longitudinal sides is 1 inch (25.4 mm).

2.5.3 These differentiating features provide for a chain link having four reduced structural dimensions und thus result in reduced material costs.

2.5.4 Even if accepting that the skilled person seeking to reduce the material costs would be inclined to reduce the width of the hinge assembly of the double hinge chain link from 80.3 mm to the value of 42.1 mm, the Board considers that the specific values of 2.5 mm for the thickness of the conveying body part, of 4.0 mm for the inside diameter of the hinge loops and of 1 inch (25.4 mm) for the pitch lie sufficiently far away from the corresponding values of 3.15 mm, 6.35 mm and 1.5 inch (38.1 mm) known from D1 for the double hinge chain link depicted on page 3, such that they cannot be considered to result from a simple application of a

trial-and-error process to see how material costs could be saved. The same reasons as in points 2.4.1 and 2.4.2 above apply here.

2.5.5 From the above follows that the chain link according to claim 1 also involves an inventive step over the double hinge chain link known from page 3 of D1.

2.5.6 The Board notes further that none of the other documents in the file contains a teaching in the direction of the above-mentioned distinguishing specific dimensions as claimed in claim 1 or renders them otherwise obvious.

2.6 Accordingly, the subject-matter of claim 1 involves an inventive step (Article 56 EPC).

3. *Claim 3 - Inventive step, Article 56 EPC*

3.1 The arguments presented under point 2 above concerning the chain link according to claim 1 apply *mutatis mutandis* to the conveyor chain according to claim 3 since said chain comprises a series of such chain links.

3.2 Accordingly, the subject-matter of claim 3 also involves an inventive step (Article 56 EPC).

4. *Claims 2, 4 to 6 - Inventive step, Article 56 EPC*

4.1 As a consequence of the conclusion under points 2 and 3 above dependent claim 2 relating to a preferred embodiment of the chain link of claim 1 and claims 4 to 6 concerning preferred embodiments of the chain of claim 3 involve also an inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent on the basis of the following documents:

description:	pages 1 and 3 to 6 of the application as filed, and page 2 as filed at the oral proceedings;
claims:	1 to 6 filed as main request at the oral proceedings;
drawings:	figures 1A to 1C and 2A to 2C of the application as filed.

The Registrar: The Chairman:

G. Nachtigall H. Meinders