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Datasheet for the decision of 5 July 2007

Case Number: T 1373/05 - 3.2.07

Application Number: 98121426.5

Publication Number: 0916599

IPC: B65G 21/20

Language of the proceedings: EN

Title of invention:
A curved element of a magnetic chain conveyor and a conveyor comprising said element

Patentee:
System Plast S.p.A.

Opponent:
Rexnord Flattop Europe B.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (main, first, second auxiliary request) - (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1373/05 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 5 July 2007

Appellant: (Opponent)	Rexnord Flattop Europe B.V. Einsteinstraat 1 NL-2691 GV 's-Gravenzande (NL)
Representative:	Prins, Adrianus Willem Vereenigde P.O. Box 87930 NL-2508 DH Den Haag (NL)
Respondent: (Patent Proprietor)	System Plast S.p.A. Via S. Rocco, 29/31 IT-24060 Telgate (Bergamo) (IT)
Representative:	Ripamonti, Enrico Giambrocono & C. s.p.a. 19/B, Via Rosolino Pilo IT-20129 Milano (IT)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 19 August 2005 rejecting the opposition filed against European patent No. 0916599 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: H. Meinders
Members: K. Poalas
I. Beckedorf

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division concerning the rejection of the opposition against European patent No. 0 916 599.

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

The Opposition Division held that the grounds for opposition mentioned in Article 100(a) EPC did not prejudice the maintenance of the patent as granted.

The following documents of the opposition proceedings are of relevance for the present decision:

D2: EP-A-0 790 197

D7: material test certificate of the firm Solidur dated 29 January 1996 of UHMWPE.

II. Oral proceedings before the Board took place on 5 July 2007.

(a) The appellant requested that the decision under appeal be set aside and that the patent be revoked.

(b) The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained as granted (main request), or alternatively, that the patent be maintained on

the basis of either the first or second auxiliary request filed during the oral proceedings.

III. Independent claim 1 as granted reads as follows:

"A curved element (3) for a magnetic conveyor comprising at least one conveyor chain (1) movable along a guide (2) comprising at least one curved portion, said curved element having a structure (5, 6; 15, 14; 16, 19; 19A; 28; 30, 31; 32) comprising at least two spaced—apart parallel rails (4) on which the chain (1) moves, magnets (17, 21A, 21B) arranged to attract the chain against the rails (4), and a lower part (10, 26) for supporting the chain during its return travel, characterised in that said structure comprises at least one first piece (5, 15, 16, 28, 30) on which the chain (1) moves and comprising said rails (4), a second piece (10, 26) comprising said lower part, and at least one third piece (6, 14, 19, 19A, 31, 31A, 31B, 32) for housing the magnets (17, 21A, 21B), said third piece being separate from the first and from the second piece and being removably connected to at least one of said pieces by connection means (9A, 11, 27A)".

Independent claim 1 according to the first auxiliary request reads as follows (additions when compared to claim 1 of the main request are depicted in bold, deletions are struck through):

"A curved element (3) for a magnetic conveyor comprising at least one conveyor chain (1) movable along a guide (2) comprising at least one curved portion, said curved element having a structure (5, 6; 15, 14; 16, 19; 19A; 28; 30, 31; 32) comprising at

least two spaced—apart parallel rails (4) on which the chain (1) moves, magnets (17, 21A, 21B) arranged to attract the chain against the rails (4), and a lower part (10, 26) for supporting the chain during its return travel, characterised in that said structure comprises ~~at least~~ one first piece (5, 15, 16, 28, 30) on which the chain (1) moves and comprising said rails (4) **and a wall connecting the rails (4) with each other**, a second piece (10, 26) comprising said lower part, and ~~at least~~ one third piece (6, 14, 19, 19A, 31, 31A, 31B, 32) for housing the magnets (17, 21A, 21B), said third piece being separate from the first and from the second piece and being removably connected to at least one of said pieces by connection means (9A, 11, 27A), **wherein the structure is formed from only three pieces**".

Independent claim 1 according to the second auxiliary request reads as follows (additions when compared to claim 1 of the main request are depicted in bold, deletions are struck through):

"A curved element (3) for a magnetic conveyor comprising at least one conveyor chain (1) movable along a guide (2) comprising at least one curved portion, said curved element having a structure (5, 6; 15, 14; 16, 19; 19A; 28; 30, 31; 32) comprising at least two spaced—apart parallel rails (4) on which the chain (1) moves, magnets (17, 21A, 21B) arranged to attract the chain against the rails (4), and a lower part (10, 26) for supporting the chain during its return travel, characterised in that said structure comprises ~~at least~~ one first piece (5, 15, 16, 28, 30) on which the chain (1) moves and comprising said rails (4) **and a wall connecting the rails (4) with each other**,

a second piece (10, 26) comprising said lower part, and ~~at least~~ one third piece (6, 14, 19, 19A, 31, 31A, 31B, 32) for housing the magnets (17, 21A, 21B), said third piece being separate from the first and from the second piece and being removably connected to at least one of said pieces by connection means (9A, 11, 27A), **wherein the structure is formed from only three pieces, and the third piece (6, 14, 19, 19A, 31, 31A, 31B, 32) comprises at least one seat (20A, 20B) for housing a magnet (17, 21A, 21B), and a cover (8, 22) for closing said seat, wherein the first piece (5, 15, 16, 28, 30), the second piece (10, 26) and the third piece (6, 14, 19, 19A, 31, 31A, 31B, 32) are constructed of different plastics materials, and the closure cover (8, 22) is formed of non—corrosible ferromagnetic material, and the first piece (5, 15, 16, 28, 30) is constructed of a polyethylene with a molecular weight greater than or equal to 7.5 million g/molecule**".

IV. The appellant argued essentially as follows:

(a) *Claim 1 according to the main request*

If at all, the only difference between the subject-matter of claim 1 and a curved element known from D2 is the absence of at least one integral first piece comprising the rails, said first piece being separate from the third piece housing the magnets.

D2 explicitly teaches the skilled person that the construction of the pieces in D2 is not limited to those specific examples given, but may for example extend to other variations having the rails formed

separately from the intermediate portion housing the magnets, see for instance column 4, lines 47 to 49.

Starting from a configuration of the curved element according to D2 having the rails formed separately from the intermediate portion, the problem to be solved is to improve the replaceability of the rails (which are susceptible to wear), since D2 would suffer from the drawback that both separate rails 4, 5 must be attached separately from each other to or removed from the intermediate portion housing the magnets, which corresponds to the third piece of claim 1 according to the main request.

The passage in column 5, lines 8 to 14 of D2 explicitly teaches the person skilled in the art that various configurations of the pieces constituting the curved element, having various material compositions, are possible. Therefore, in order to solve the problem of easily replacing the rails, the person skilled in the art would construct the first piece as comprising both rails in the form of an integral piece so that they can be attached to or removed from the intermediate portion simultaneously, without exercising an inventive skill.

(b) *Claim 1 according to the first auxiliary request*

The same arguments presented in point IV-a) above also apply to the subject-matter of claim 1 according to the first auxiliary request.

(c) *Claim 1 according to the second auxiliary request*

The subject-matter of claim 1 of the second auxiliary request differs from a curved element known from D2 in that it involves a first piece which is separate from the third piece and which comprises the rails and a wall connecting said rails, in that the structure of the curved element is formed from only three pieces, in that the ferromagnetic closure cover is non-corrosible, in that the first piece, the second piece and the third piece are constructed of different plastic materials, and in that the first piece is constructed of a polyethylene with a molecular weight greater than or equal to 7.5 million g/molecule.

All these differentiating features are workshop modifications which lie within the normal design choices of the person skilled in the art.

Furthermore, before the priority date of the patent in suit the appellant publicly used magnetic curved elements for chain conveyors made of UHMWPE with a molecular weight of 7.3 million g/molecule. D7, a material test report from the firm Solidur, confirms that this material has the mentioned molecular weight. The choice of a material which is readily available on the market and which has a molecular weight greater than or equal to 7.5 million g/molecule, ie. a molecular weight similar to that of the commercial product used by the appellant is a normal material selection without any inventive component.

Therefore, the subject-matter of claim 1 of the second auxiliary request is not inventive.

V. The respondent argued essentially as follows:

(a) *Claim 1 according to the main request*

The problem to be solved in the curved element of D2 is to manufacture the upper part of the curved element more cheaply, see column 1, lines 42 to 45.

According to column 2, lines 16 to 20 of D2 the portion of the upper and lower part of the curved element which does not come into contact with the conveyor chain needs "not to have any particular wear resistance or good sliding properties". Moreover, according to column 2, lines 21 to 23 in the upper part and in the return part of the curved element, the chain links only come into contact with a portion of the legs thereof. The residual portion only serves to give the necessary shape and stability, see column 2, lines 23 to 26. Finally, the residual portion "is manufactured according to the invention from plastic material that is cheaper than the material from which the rest of the upper or return part is manufactured", see column 2, lines 26 to 31.

Thus, the above-mentioned passages of D2 clearly teach the person skilled in the art to realise an upper part having only that part of the two rails which comes into contact with the links of the chain made of a wear—resistant material layer. They discourage the use of a wear-resistant material layer for the entire upper part.

Therefore, the skilled man would not modify the curved element of D2 such that there would be one single upper

portion of wear-resistant material comprising both rails and a connecting part, because this is contrary to the teaching of D2 itself.

(b) *Claim 1 according to the first auxiliary request*

In D2 no hint exists for constructing a curved element with a structure having only three pieces as claimed in claim 1 of the first auxiliary request. The person skilled in the art following the teaching of the passage in column 4, lines 47 to 50 would inevitably arrive at a curved element having at least six different elements, ie. two rails of wear-resistant material in the upper part, another two wear-resistant material rails in the lower part, and two connecting parts of cheaper material, respectively for the upper part and the lower part, each connecting the respective rails.

(c) *Claim 1 according to the second auxiliary request*

A curved element having the first piece, the second piece and the third piece constructed of different plastics material and also having the first piece constructed of a polyethylene with a molecular weight greater than or equal to 7.5 million g/molecule diminishes the production costs of such an element. Since no hint can be found in the state of the art guiding the person skilled in the art towards this specific material selection the subject-matter of claim 1 of the second auxiliary request fulfils the requirements of Article 56 EPC.

Reasons for the decision

1. *Claim 1 according to the main request*

1.1 Closest prior art

D2, representing the most relevant prior art, discloses on the basis of the embodiment shown in figures 1 and 2, using thereby the wording of claim 1 of the patent in suit, a curved element 1, 2 for a magnetic conveyor comprising at least one conveyor chain 6, 7, 8 movable along a guide 1 comprising at least one curved portion, said curved element having a structure comprising two spaced-apart parallel rails 4, 5 on which the chain moves, magnets 10', 10'' arranged to attract the chain against the rails, and a lower part 2 for supporting the chain during its return travel. The separation line between the intermediate portions 3 and 15 is also the separation line between the upper part 1 and the return part 2. According to column 4, lines 47 to 50 each portion of the upper or return part can be separately formed and then joined together by means of screws. This means that in this embodiment of the invention disclosed in D2 the different portions of the upper or return part shown in figure 2 are removably connected to each other.

In that case the two rails 4 and 5 and the intermediate portion 3 are fabricated separately. The intermediate portion 3 housing the magnets 10', 10'' corresponds in this case to the claimed "third piece" and the return part 2 being the "lower part for supporting the chain during its return travel" corresponds to the claimed

"second piece". The rails are removably connected to the third piece.

The appellant argued that the curved element of claim 1 did not limit the first piece to being only one integral entity.

The respondent argued that it was clear from the description and the drawings of the patent in suit that the first piece comprised the rails connected to each other, thus defining one integral piece. Spaced-apart pieces having no interconnection to each other did not fall within the meaning of "a first piece" as claimed in claim 1.

In view of the result of the discussion on inventive step, when adopting the reasoning of the respondent, the Board considers it not necessary to decide on this question. For the discussion of inventive step it is assumed that there is one distinguishing feature: the first piece being one integral entity comprising the two rails and a connecting wall.

1.2 Problem

The effect of this feature is that the two rails can be replaced more easily, without the need of adjustment of the rails in respect of each other. Starting from D2 the problem to be solved is thus to improve the replaceability of the two leg portions/rails 4 and 5, since D2 suffers from the drawback that both spaced-apart leg portions/rails 4, 5 must be separately attached to the intermediate portion 3 and be adjusted accordingly.

1.3 Solution

The above-mentioned problem is solved in the claimed curved element in that at least a first piece is foreseen which comprises said leg portions/rails in one integral entity, said first piece being separate from the third piece housing the magnets.

1.4 Obviousness

1.4.1 In column 5, lines 8 to 14 of D2 it is stated that "within particular limits there is a choice as to what portion of the legs or connecting part will consist of cheap plastic material, as long as it is ensured that those portions that have a guiding function for the chain link consist of a high-grade wear-resistant material". This passage teaches that technical reasons dictate the use of a wear-resistant material at the locations where it is necessary, but that economic considerations apply to how much of this material is used. In figure 2 of D2 the rails are shown as being entirely of one type of material, which can only be the wear-resistant material.

1.4.2 According to column 4, lines 38 to 47 of D2 the different parts of the curved element "can beforehand have been moulded or pressed to form a plate and the upper part and the return part have then been formed from such a plate by milling. It is also possible first to form the separate portions of the upper or return part separately and then to join them together by means of screws or glueing". This passage provides the general teaching that the piece comprising the rails

can be advantageously produced as one single entity, with a bridging portion remaining between the rails after milling. It is evident that an integral entity comprising both the rails and a connecting wall between them solves the problem discussed above.

1.4.3 The only question regarding inventive step to be answered then is "would the skilled person produce the rails out of a plate solely of wear-resistant material?"

The respondent argued that one should take into consideration that in column 1, lines 42 to 45 of D2 it is envisaged that the problem to be solved is to manufacture the upper part of the curved element more cheaply and that in column 2, lines 16 to 31 of D2 it is clearly stated that a large part of the upper and lower part of the curved element does not come into contact with the links of the conveyor, ie. that the chain links only come into contact with a portion of the legs. Further, the residual portion of the legs and connecting portion only serve to give the upper part the necessary shape and stability; they are manufactured of a cheaper plastic material. This results in an upper part in which the portions realised in wear—resistant material should not be connected to each other because it causes waste of expensive material. The skilled person would not modify the curved element of D2 by producing one single upper portion in wear-resistant material comprising the two legs and the connecting wall, because this is contrary to the teaching of D2.

1.4.4 The Board considers that the skilled person trying to solve the above-mentioned problem of improving the replaceability of the leg portions would have to compare the extra labour and production costs of using the wear-resistant material as sparingly as possible by first producing a laminated plate with only that much high-grade wear-resistant material as is necessary, on top of a layer of low-cost material and subsequently producing said rails by milling and subsequently fixing these rails separately to the intermediate portion 3, with partially saving costs by doing away with the laminated structure, milling the rails in a plate entirely made of wear-resistant material, at the expense of wear-resistant materiel remaining as a wall bridging the rails and fixing said integral piece to the intermediate portion 3. Both solutions are considered by the Board to be feasible for the skilled person, as they depend on economic, not technical parameters.

1.4.5 Furthermore, though it is indisputable that D2 refers to the problem of manufacturing the upper part of the curved element more cheaply, see column 1, lines 42 to 45, at the same time in claim 1 and in column 1, lines 46 to 53, when describing the solution to said problem, it states that "at least the portion of the legs of the upper part that forms the guide for the bearing surfaces and connection systems of the chain links consists of a first, high-grade type of plastic material, that the residual portion, **if any** [emphasis added by the Board], of the legs and the connecting portion consists of at least a second type of plastic material, and that the upper part is manufactured from a single composite plate of plastic material".

The expression "**if any**" used therein makes clear that the curved element proposed in D2 encompasses also the following two alternatives:

(a) having the legs entirely consisting of high-grade plastic material and the connecting portion being only partially of high-grade plastic material, and

(b) having the legs and the connecting portion consisting completely of said high-grade material.

This fact is also supported by the passage in column 5, lines 10 to 14 of D2 teaching the person skilled in the art that the percentage of high-grade wear-resistant material used in the legs or in the part connecting the legs can vary "within particular limits", "as long as it is ensured that those portions that have a guiding function for the chain link consist of a high-grade wear-resistant material".

1.4.6 In any case, the respondent presented no evidence in support of its argument that the extra material costs of the high-grade wear-resistant material would prevent the skilled person from adopting the solution as suggested by the Board.

Accordingly, the Board concludes that the subject-matter of claim 1 as granted does not involve any inventive step (Article 56 EPC).

2. *Claim 1 according to the first auxiliary request*

2.1 The curved element according to claim 1 of the first auxiliary request differs from the curved element according to claim 1 of the main request in that it involves only one first, one second and one third piece, whereby the first piece comprises in addition to the rails a wall connecting the rails with each other.

The feature of the first piece being only one integral entity comprising the rails and a connecting wall between the rails, made of high-grade wear-resistant material, has already been dealt with as not involving inventive step, see point 1.4 above.

In the curved element disclosed in D2, furthermore, the third piece housing the magnets is present only in singular form.

2.2 Remains therefore the question whether the curved element of D2 comprises only one second piece comprising the lower part supporting the chain during its return travel.

From figure 2 of D2 it is clearly derivable that there is only one single piece 2 which comprises the lower part 15 which cooperates with the rails 16 and 17 in the legs 13 and 14 in supporting the same during its return travel.

Therefore, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step for the same reasons as given above for claim 1 of the main request.

2.3 The result of the application of normal technical and economical skills of the skilled person as discussed above in point 1.4 is a curved element with only one first, one second and one third piece (following the wording of the claim), not six pieces as argued by the respondent.

3. *Claim 1 according to the second auxiliary request*

3.1 As shown in figure 2 of D2 the intermediate portion 3 comprises two seats for housing the magnets 10', 10'' and a cover 11 for closing said seats. Furthermore, the cover 11 is made from a ferromagnetic material, see column 4, lines 20 to 21, and as an example for a high-grade wear-resistant plastic material to be used for the upper and return part UHMWPE (ultra high molecular weight polyethylene) is mentioned, see column 2, lines 36 to 40. In addition to that the use of different plastic materials for the upper part and the return part is also mentioned as an alternative, see column 5, lines 14 to 20.

In point 2.2 above it has also been concluded that the structure of the curved element of D2 is formed from only three pieces. The curved element according to claim 1 of the second auxiliary request differs from the curved element known from D2 by the following features:

(a) the first piece is separate from the third piece and comprises the rails and a wall connecting said rails,

(b) the ferromagnetic closure cover is non-corrosive,

(c) the first piece, the second piece and the third piece are constructed of different plastic materials, and

(d) the first piece is constructed of a polyethylene with a molecular weight greater than or equal to 7.5 million g/molecule.

Concerning the construction of the first piece reference is made to the conclusion arrived at in point 1.4 above.

3.2 As regards the three remaining differentiating features the Board concludes as follows:

Firstly, it is well-known to the person skilled in the art that in order to protect ferromagnetic parts exposed to an aggressive environment a non-corrosive material has to be chosen. This fact was not contested by the respondent. Therefore, the selection of a non-corrosive material for the ferromagnetic closure cover of the magnets does not demonstrate an inventive step.

Secondly, the Board considers the information disclosed in column 5, lines 14 to 20 of D2 to be an indication to the skilled person to use different plastic materials for the different parts of the curved element, depending on the circumstances. Accordingly, the Board considers the construction of the first piece, the second piece and the third piece of different plastic materials as a workshop modification which falls within the normal practice of the person skilled in the art.

Thirdly, in the patent in suit itself it is stated that an UHMWPE with a molecular weight greater than or equal to 7.5 million g/molecule as used for the wear-resistant parts is readily available on the market as a product of Hoechst under the name "HOSTALEN GUR 4170", see column 4, lines 8 to 22 of the patent specification. This is also supported by the unchallenged documentary evidence D7 which refers to an UHMWPE with a molecular weight of approximately 7.3 million g/molecule, ie. with a molecular weight only slightly lower than the one claimed in claim 1 of the second auxiliary request.

The Board fails to see how the selection of a generally available UHMWPE for the rails of the curved element known from D2 could support inventive step.

For the above-mentioned reasons, the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step either.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar: The Chairman:

G. Nachtigall H. Meinders