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**Datasheet for the decision
of 27 June 2014**

Case Number: T 0697/10 - 3.5.02

Application Number: 03006902.5

Publication Number: 1351362

IPC: H02G11/00, F16G13/16

Language of the proceedings: EN

Title of invention:

Protective guide for flexible elongated article

Patent Proprietor:

Tsubakimoto Chain Co.

Opponent:

igus GmbH

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - obvious modification

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 0697/10 - 3.5.02

**D E C I S I O N
of Technical Board of Appeal 3.5.02
of 27 June 2014**

Appellant: igus GmbH
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Respondent: Tsubakimoto Chain Co.
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Representative: Patentanwälte
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
22 February 2010 concerning maintenance of the
European Patent No. 1351362 in amended form.**

Composition of the Board:

Chairman M. Ruggiu
Members: M. Léouffre
W. Ungler

Summary of Facts and Submissions

- I. The opponent appealed against the interlocutory decision of the Opposition Division, posted on 22 February 2010, on the amended form in which the European patent No. 1 351 362 can be maintained. The statement setting out the grounds of appeal was received on 11 June 2010.
- II. The Opposition Division held that the subject-matter of claim 1 of the then auxiliary request 1 was new and involved an inventive step having regard to documents
D1 = DE 1 574 367 A,
D2 = DE 44 28 680 C1,
D3 = Brochure "System E6" April 2001,
D4 = Brochure "System E6" May 2001, and
A7 = DE 20 107 003 U together with
WO 02 086 349 A (A7').
- III. In the statement setting out the grounds of appeal the appellant argued that the patent in suit contained subject-matter which extended beyond the content of the application as filed, contrary to Article 123(2) EPC, and that the subject-matter of the claims did not involve an inventive step (Article 56 EPC) having regard to the protective guide called "System E6" which had been exhibited at the trade fair in Hannover in April 2001, at the LIGNA in Mai 2001 and at the EMO in September 2001. The appellant cited also witnesses who could provide evidence thereof.
- IV. In a communication dated 9 December 2013, the board expressed the preliminary opinion that the patent in suit contained subject-matter which extended beyond the content of the application as filed, contrary to Article 123(2) CBE, and invited the appellant to

- indicate which of the features of the protective guide were made available to the public by exhibition of the "System E6", and which nominated witnesses could corroborate the allegations.
- V. By letters dated 3 February 2014 and 24 February 2014, the appellant nominated Mr. Harald Nehring and Mr. Andreas Hermey as witnesses.
- VI. Summons to oral proceedings were issued on 24 March 2014. The appellant was invited to bring along the nominated witnesses, so that they could be heard in case the question of inventive step should be addressed.
- VII. During the oral proceedings which took place as scheduled on 26 and 27 June 2014, order to take evidence was issued regarding the assertions of the appellant that protective guides (chains) of the type "System E6" had been made available to the public at the trade fair in Hannover in April 2001, at the LIGNA trade fair in May 2001 and at the EMO trade fair in September 2001 by hearing the witnesses Mr. Harald Nehring and Mr. Andreas Hermey, who were then heard immediately.
- VIII. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No.1351362 be revoked.
- IX. The respondent (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the claims of a main request or, if this is not possible, on the basis of the claim of an auxiliary request, both filed at the oral proceedings of 26 and 27 June 2014.

X. Claim 1 of the main request reads as follows
(subdivision of features added by the board):

1 "Protective guide for a flexible, elongated article,
comprising

2 a plurality of links (2; 12) connected to one another,
3 each link (2; 12) being formed by a pair of spaced and
opposed side plates (3; 13),

4 a first connecting plate (6) extending from an upper
edge of one side plate (3; 13) to an upper edge of the
other side plate (3; 13) and

5 a second connecting plate (6) extending from a lower
edge of the one side plate (3; 13) to a lower edge of
the other side plate (3; 13), wherein

6 each of the side plates (3; 13) is a unitary element
including a connecting rod (4; 14) protruding from a
first side edge (3c; 13c) thereof,

7 an enlarged engagement portion (4b; 14b) is formed at
an end of each connecting rod (4; 14), and

8 a connecting recess (5; 15) formed in a second side
edge (3d; 13d) opposite to the first side edge, having
an engagement opening (5b; 15b) into which a connecting
rod (4; 14) with its engagement portion of a side plate
(3; 13) of an adjacent link (2; 12) extends, whereby

9 adjacent links (2; 12) of the guide (1; 11) are
articulably connected to one another,

10 the second side edge (3d; 13d) of each side plate (3;
13) comprises an inclined surface on one side of the
connecting recess (5; 15), which limits the
articulation of adjacent links (2; 12) to a
predetermined angle, wherein

11 the connecting rod (4; 14) includes a flexible portion
(4a; 14a),

12 said flexible portions (4a; 14a) of the connecting rods
(4; 14) of the side plates (3; 13) of each link (2; 12)
are flexible about axes extending in the direction from

one side plate (3; 13) to an opposite side plate (3; 13), and
13 said enlarged engagement portion (4b; 14b) being formed
at the end of each connecting rod (4; 14) of one side
plate (3; 13) fits into, and is secured to, the
engagement opening (5b; 15b) of the side plate (3; 13)
of the adjacent link (2; 12), by press-fitting,
14 wherein the side plates (3; 13) and connecting rods (4;
14) have no portions which rub against each other
frictionally as the guide bends,
15 wherein the enlarged engagement portion (4b; 14b) has a
rectangular shape, or an oval shape."

Claim 2 is dependent on claim 1.

XI. The claim of the auxiliary request specifies the
connecting recess mentioned in feature 8 of the main
request as having "an entry portion (5a, 15a)", adds
the reference sign "(3f; 13f)" after the words
"comprises an inclined surface", specifies the inclined
surface mentioned in feature 10 as being "positioned
for engagement by a portion of the first side edge (3c;
13c) of the adjacent side plate (3; 13)," and adds the
following feature to claim 1 of the main request:
"and wherein the entry portion (5a; 15a) of the
connecting recess (5; 15), into which the connecting
rod (4; 14) extends, gradually widens in a direction
from the engagement opening (5b; 15b) toward the second
side edge (3d; 13d) of the side plate (3; 13) from
which the last-mentioned connecting rod (4;14)
extends".

XII. The appellant essentially argued as follows:

a) The witnesses testified that the protective guide called
"System E6" had been exhibited at the Hannover trade
fair of year 2001.

The witnesses demonstrated that the "System E6" comprised a plurality of links connected to one another, each link being formed by a pair of spaced and opposed side plates, and each second link presenting first and second connecting plates extending respectively from an upper edge of one side plate to an upper edge of the other side plate and from a lower edge of the one side plate to a lower edge of the other side plate. The adjacent links were connected over a connecting rod having a portion flexible about axes extending in the direction from one side plate to an opposite side plate. Enlarged engagement portions having a cylindrical shape were formed at each end of the connecting rods for engaging with an opening of a connecting recesses formed in the side edges of the side plates. The adjacent links of the protective guide were thereby articulably connected to one another, and a side edge of each side plate comprised an inclined surface on one side of the connecting recess, which limited the articulation of adjacent links to a predetermined angle. The enlarged engagement portions of each connecting rod were fitted into, and secured to, the engagement openings of the side plates of adjacent links, by press-fitting.

Actually the witnesses clearly indicated that the cylindrical portion used as engagement portion presented a diameter slightly larger than the engagement opening of the side plates and that the fitting of the engagement portion into the engagement opening could be considered as a press-fit, even if, contrary to a press-fit in a metallic material, it did not lead to a deformation of the engagement portion of the connecting rod because of the properties of the material used for the protective guide which was plastic.

Finally the witnesses testified that system E6 had been developed to be used also in clean rooms and therefore did not comprise any portion of the side plates and connecting rods which rub against each other frictionally as the guide bend.

Hence it was admitted that the subject-matter of claim 1 of the main request could be seen as differing from the prior use of system E6 in that

- each link comprised one upper and one lower connecting plates;
- each of the side plates was a unitary element including a connecting rod protruding from a first side edge thereof (feature 6); and in that
- the enlarged engagement portion had a rectangular shape, or an oval shape (feature 15).

These features had nothing in common and did not interact with each other.

The number of connecting plates could be seen as improving the protection or guidance provided by the protective guide. System E6 used only one connecting plate because the links were short enough. For large protective guides according to System E6 the provision of two connecting plates per link would have been an obvious measure (cf. also item 4.5.5 of the decision of the opposition division).

The connecting rods of system E6 comprised the same cylinder like engagement portion at both ends. However there was no need to provide the same engagement portion at both ends. For instance, in order to reduce the number of parts of each link a person skilled in the art would have provided one end of the connecting rod as a unitary part of the side plate as shown in D2 (column 1, lines 49 to 64 and Figure 2) without

exercising any inventive skill. This would have however worsened the solution proposed in system E6 because the material used for the side plates and the connecting rods should have different properties. The side plates should provide rigidity while the connecting rods should be flexible. Hence each unitary side plate had to be made of two different materials. This was acknowledged in the patent in suit in section [0047] where it is stated that the moulding process should involve two different materials. Claim 1 was however not limited to the use of two different materials for the connecting rod and the side plate. Hence the subject-matter of the claim covered solutions which were worse than the solution of the prior use.

The formulation of the last feature concerning the form of the engagement portion was general and limited to a two-dimensional surface view. Any cylinder, and thus each cylinder at the end portion of the connecting rod of system E6, had a generally rectangular portion, at least when seen from above.

This feature was also a usual measure for a person skilled in the art. It aimed at implementing a form fitting connection to avoid any rotation between the connecting rod and the engagement portion. In this respect feature 15 had to be seen as part of feature 13 specifying how the enlarged engagement portion of the connecting rod was fitted and secured to the engagement opening of the side plate. A form fitting connection as defined by feature 15 appeared as one of several well known and notorious possibilities, an example of a well-known rectangular form-fitting connection for avoiding rotation was the connection between a door handle and its lock. Furthermore the description recited that both rectangular and circular forms could be used (cf. section [0047] of the patent in suit).

The witnesses might have said that system E6 remained unchanged since the year 2001 and that no proposal had been made to amend system E6. It did not change the fact that, having regard to system E6, the three new features were obvious and did not solve any particular problem without worsening system E6.

- b) Concerning the auxiliary request, the added feature introduced new discussions which led to new technical questions which could and should have been asked to the witnesses. The auxiliary request was therefore late filed and should not have been admitted into the proceedings.

The added feature was derived from original claim 3 but not completely supported by this claim.

With this feature, the proprietor wanted to cover the case wherein the recess was widened from the engagement opening to the edge of the side plate. However in each embodiment the engagement opening was first reduced before being widened (cf. figures 3, 6 and 10B of the patent in suit). This feature was therefore not clear. This feature was also not clear because the side plate from which the connecting rod extended was possibly a side plate of a neighbour link.

This feature was also known from system E6. Actually the witness specified that the cylindrical engagement portion of the connecting rod was maintained by press-fitting and form-fitting an engagement portion in the form of an Ω . The basis of the Ω opening being part of the engagement opening of the side plate, the remaining recess should be seen as widening from the end of the engagement opening to the edge of the side plate. Hence, the claim of the auxiliary request did not involve an inventive step having regard to system E6.

XIII. The proprietor essentially argued as follows:

- a) According to the witnesses, system E6 was provided with connecting rods and side plates wherein each connecting rod had a cylindrical engagement portion with a central ring as a groove which engaged a cylindrical protrusion provided inside each engagement opening of the side plate. Pressure was therefore required to push the cylindrical portion into the engagement opening in order to counter-act the resistive force created by the protrusion. The ring and the protrusion constituted form-fitting cooperating elements. There was no press-fitting of the engagement portion into the engagement opening. A second form-fitting cooperation existed between the basis or remaining portion of the Ω -like engagement opening and the connecting rod. This second form-fitting was also not a press-fitting engagement.

The rectangular shape or the oval shape of the engagement portion should be understood as a profile. The reasoning of the appellant concerning the rectangular form of a cylinder did and could not apply to an oval form. This gave a hint that the feature could only be understood as defining the shape of the profile of the engagement portion.

The features identified by the appellant as differing from system E6 did contribute together to the solution of a common problem, namely reducing the accumulation of dust. Actually, while the press-fitting and form fitting of one end of the connecting rod contributed to reduce the accumulation of dust, the other end of the connecting rod was unified with the side plate and thereby reduced even further the friction and the accumulation of dust since it completely suppressed the

relative rotation between an end of the connecting rod and a side plate.

A unitary part comprising a side plate and a connecting rod was not a worse solution than a couple formed of separate connecting rod and side plate. Actually the number of parts was reduced and a solution to the problem of assuring flexibility of the connecting rod while keeping the rigidity of the side plate was given in the patent in suit in section [0047]. The unification of the connecting rod with a side plate could have even been achieved with an adhesive. This solution was not exhibited in Hannover since system E6 involved an engagement portion having a larger diameter than the engagement opening.

System E6 remained unmodified for the last thirteen years which indicated that there was no incentive to modify this system and no reason to apply a problem solution approach starting from system E6. A person skilled in the art would not have therefore contemplated the application of the teaching of D2 to system E6.

- b) The supplementary feature of claim 1 of the auxiliary request was supported by sections [0017] and [0027] and original claim 3 of the A2 publication. Original claim 3 had never been abandoned. There was therefore no question of late request. A problem solved by this feature was to shorten the length of the link.

Reasons for the Decision

- 1. The appeal is admissible.
- 2. *Main request*
 - 2.1 Article 123(2) EPC

Features 1 to 6, 8, 9 and 11, respectively features 7 and 13 are features of original claim 1, respectively original claim 2, whereby feature 13 has been amended to recite that the engagement portion is secured in the engagement opening by press-fitting as originally disclosed in section [0019] of the published application. Basis for feature 10 was original claim 3 and the remaining features 14 and 15 were originally disclosed in sections [0012] and [0044] of the published application. Finally, feature 12 was immediately and unambiguously derivable from the application as a whole and in particular from section [0029].

Claim 1 is therefore considered as complying with the requirements following from Article 123(2) EPC.

2.2 *Article 54(3) EPC 1973*

Document A7', which falls under Article 54(3) EPC 1973, discloses a protective guide for a flexible, elongated article, from which claim 1 differs in that:

- each link comprises a pair of connecting plates, and in that
- the enlarged engagement portion (4b; 14b: 44b) has a rectangular shape or an oval shape.

The subject-matter of claim 1 is therefore novel having regard to document A7'.

2.3 *Article 54(2) EPC 1973*

- 2.3.1 Following the hearing of the witnesses nominated by the appellant, the board concluded that a protective guide called "System E6" had indeed been exhibited and made accessible to the public in April 2001, i.e. before the

priority date, at least at the trade fair in Hannover. The patent proprietor did not contest this allegation.

2.3.2 As regards the witnesses' testimonies the Board emphasises that both witnesses had detailed knowledge about the development of the system E6, about the appellant's general practice of exhibiting products, in particular newly developed products, at different trade fairs, about the concrete circumstances of the exhibition of the product system E6 at the trade fair in Hannover in April 2001, and about the technical details and the functioning of that product. Furthermore, both witnesses credibly stated that the product system E6 was exhibited at the aforementioned trade fair at the appellant's booth by making the product physically accessible to trade fair visitors. Visitors were able to take the product into their hands and to examine its technical details and functioning. Furthermore, the witness Mr Hermey, who was responsible for the development of the product line system E6, explained that he could specifically remember exhibition of the system E6 at the Hannover trade fair in April 2001, due to the fact that he had been responsible for the development of that product, which comprised several remarkable and innovative features, and because he visited that fair (cf. 'Niederschrift' pages 27 to 29, 39 and 41). The Board sees no reasons to doubt the comprehensive and detailed explanations of the witnesses, which are also considered to be in line with the technical information contained in documents D3 and D4. In particular due to the fact that trade fair visitors could take an example of the product system E6 into their hands the Board has no doubt that all the technical features of the chain (cf. point 2.3.3 below) were made available to the public before the priority date of the patent in suit and thus form

part of the state of the art according to Article 54(2) EPC.

2.3.3 Having taken into account in particular the witnesses testimonies and the documents D3 and D4, the Board considers as sufficiently proven that chains of the product line 'system E6' comprised the following technical features: Products of the type 'system E6' are protective guides for a flexible, elongated article, comprising a plurality of links connected to one another wherein every second link is constituted of six parts, namely a pair of spaced and opposed side plates, two connecting plates and two connecting rods. The side plates are provided with two recesses, each for receiving an enlarged portion of a connecting rod. Each connecting rod is constituted of a flexible rod with enlarged engagement portions at both ends. The profile of the engagement portions is cylindrical. A groove in form of a ring is formed in the middle of the so-formed cylinder. A protrusion, which is provided inside the engagement opening of the side plate, snaps into the groove when the engagement portion of the connecting rod is inserted into the engagement opening of the side plate. The cylindrical engagement portion has a slightly larger diameter than the circular part of the engagement opening of the side plate whereby no play remains between the engagement portion and the engagement opening. These conclusions were announced at the oral proceedings and were not contested by the proprietor.

2.3.4 The proprietor did however consider that the engagement portion of the connecting rod was only form-fitted and not press-fitted into the engagement opening of the side plate.

The board does not agree with the proprietor. Actually, like in the contested patent, there is no play between the side plates and connecting rods of system E6.

Furthermore the side plates and connecting rods are made of plastics or synthetic resin and therefore elastic. By pressing the circular engagement portion of the connecting rod into the smaller engagement opening of the side plate a small deformation of one or both parts takes place. Contrary to a usual press-fit between metallic pieces, the deformation is reversible because of the elasticity of the material used for the side plates and connecting rods. Like in the patent in suit, the elasticity of the material allows the form-fitting and tight-fitting of the cylindrical engagement portion of the connecting rods into the engagement opening of the side plates. A tight-fitting engagement of a form-fitting element realised under pressure is usually called a press-fit.

Press-fitting is also considered as provided by the portion of the side plate surrounding the rod part of the connecting rod, close and adjacent to the circular engagement opening. The whole engagement opening of the side plate cooperating with the engagement portion of the connecting rod is therefore seen as having an Ω -like shape.

The press-fitting engagement contributes to avoid friction between the connecting rods and the side plates. The board concludes therefore that the connecting rod of system E6 is press-fitted in the engagement opening of the side plate in the sense of the patent in suit.

- 2.3.5 The subject-matter of claim 1 of the main request is thus considered as differing from system E6 in that:
- each link is formed by a first connecting plate (6) extending from an upper edge of one side plate (3; 13)

to an upper edge of the other side plate (3; 13) and a second connecting plate (6) extending from a lower edge of the one side plate (3; 13) to a lower edge of the other side plate (3; 13); and

- each of the side plates is a unitary element including a connecting rod protruding from a first side edge thereof (feature 6); and
- the enlarged engagement portion (4b; 14b) has a rectangular shape, or an oval shape" (feature 15).

Actually, even if a cylindrical form may be seen as having a rectangular shape, it is considered that the last feature mentioned above has to be understood in the light of the whole application and therefore as defining a profile shape.

The subject-matter of claim 1 is therefore new.

2.4 *Article 56 EPC*

2.4.1 Every second link of system E6 was provided with connecting plates joining an upper edge or a lower edge of a side plate with the upper edge or the lower edge of the other side plate. It is however obvious for a person skilled in the art to provide a protective guide like system E6 with two connecting plates per link if the size of the links or the required protection of the transported cables renders this measure necessary.

2.4.2 Feature 6 brings the advantages of reducing the number of parts per link and reducing further the risk of friction and dust accumulation (cf. patent specification section [0049]). This feature shall not be seen as worsening the solution disclosed by system E6. Actually even if claim 1 does not specify that the side plates and the connecting rods are constituted of two different materials for assuring rigidity of the side plates and flexibility of the connecting rod, the

specification of the patent in suit teaches (cf. section [0047]) how flexibility and rigidity may be assured while producing a unitary element.

Nevertheless the board considers feature 6 has an obvious possibility for a person skilled in the art willing to reduce the number of parts of the links, especially taking into account the disclosure of D2 (see Figure 2 and column 1, lines 49 to 64).

2.4.3 Considering feature 15, the board shares the view of the appellant that a rectangular shape is a straight forward and notorious solution to realise a tight fit connection avoiding relative rotation between two mechanical parts. The claimed rectangular or oval shape is therefore an obvious alternative to the Ω -like shape of the engagement portion of the connecting rods used in system E6.

The subject-matter of claim 1 of the main request is therefore not considered as involving an inventive step (Article 56 EPC).

3. *Auxiliary request*

Claim 1 of the auxiliary request comprises further features defining the inclined surface of the second side edge and the connecting recess of the side plates.

The inclined surface is

- positioned for engagement by a portion of a first side edge of the adjacent side plate, and

- limits the articulation of adjacent links to a predetermined angle, and

the connecting recess

- has an entry portion (5a, 15a) into which the connecting rod extends, and gradually widens in a direction from the engagement opening (5b; 15b) toward the second side edge (3d; 13d) of the side plate (3,

13) from which the last-mentioned connecting rod (4;
14) extends.

3.1 *Article 123(2) EPC*

These features were considered as disclosed in sections [0017] and [0027] of the published application (Article 123(2) EPC).

3.2 *Article 56 EPC*

The first feature is known from system E6 wherein each side plate also presents an inclined surface for engagement by a portion of the adjacent side plate and for limiting the articulation of the adjacent link to a predetermined angle.

The last mentioned connecting rod recited in the last feature mentioned above is the connecting rod mentioned in feature 8 of claim 1 i.e the connecting rod having an engagement portion press-fitted in the engagement opening of the side plate. This feature aims at defining the recess with respect to the engagement opening of the side plate. This feature does not involve an inventive step because the engagement opening of system E6 comprises a circular opening with an adjacent part forming together an Ω -like opening in which the engagement portion of the connecting rod is press-fitted and from which the recess of the system E6 widens in a direction toward the second side edge of the side plate.

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:



U. Bultmann

M. Ruggiu

Decision electronically authenticated