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Datasheet for the decision of 20 February 2008

Case Number: T 0603/06 - 3.2.01

Application Number: 97927426.3

Publication Number: 0846880

IPC: F16C 29/06

Language of the proceedings: EN

Title of invention:
Slide guide and its roller chain with ends

Patentee:
THK CO. LTD.

Opponent:
Schaeffler KG

Headword:
-

Relevant legal provisions:
EPC Art. 123(2),(3)

Relevant legal provisions (EPC 1973):
EPC Art. 100(c), 111(1)

Keyword:
"Extended protection (yes: main request; second auxiliary request)"
"Extended subject-matter (yes: first auxiliary request)"
"Remittal to first instance (yes: third auxiliary request)"

Decisions cited:
G 0001/93

Catchword:
-

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Case Number: T 0603/06 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 20 February 2008

Appellant: (Patent Proprietor)	THK CO. LTD. 11-6, Nishi Gotanda 3-chome Shinagawa-ku Tokyo 141 (JP)
Representative:	Grünecker, Kinkeldey Stockmair & Schwanhäusser Anwaltssozietät Maximilianstrasse 58 D-80538 München (DE)
Respondent: (Opponent)	Schaeffler KG Industriestrasse 1-3 D-91074 Herzogenaurach (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted 16 March 2006 revoking European patent No. 0846880 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: S. Crane
Members: C. Narcisi
T. Karamanli

Summary of Facts and Submissions

I. European patent No. 0 846 880 was revoked by the decision of the Opposition Division posted on 16 March 2006. An appeal was filed against this decision by the Patentee on 7 April 2006 and the appeal fee was paid at the same time. The statement of grounds of appeal was filed on 25 July 2006.

II. Oral proceedings were held on 20 February 2008. The Appellant requested that the decision be set aside and that the case be remitted to the first instance for further prosecution on the basis of the claims according to the main or first auxiliary request filed with letter of 11 January 2008, or the second or third auxiliary request submitted at the oral proceedings. The Appellant withdrew the further auxiliary requests submitted on 9 August 2007. The Respondent requested that the appeal be dismissed with respect to the main request and to the first and second auxiliary requests. With respect to the third auxiliary request it requested that the case be remitted to the first instance for further prosecution.

Claim 1 according to the main request reads as follows:

"A sliding guide apparatus containing a track rail (1), a moving body (2) which moves along said track rail and a plurality of rolling elements (3) which roll between said moving body and track rail while being loaded with a load, said track rail having a rolling path (1a) on which said rolling elements roll, said moving body comprising a main unit (5) having a loaded rolling path (4a) in which loaded rolling elements roll facing the

rolling path of said track rail and an unloaded rolling path (4b) in which unloaded rolling elements roll, and a pair of lid portions (6) which are mounted on front and rear ends in the advancement direction and in which direction changing paths (7) for said rolling elements for connecting the loaded rolling path and the unloaded rolling path are formed, said loaded rolling path and unloaded rolling path of said moving body, direction changing path and rolling path of said track rail facing said loaded rolling path of said moving body forming a full track for said rolling elements, said plurality of rolling elements being connected by at least one flexible resin connecting body (12) having interposed sections (13) which are interposed between the respective rolling elements and connecting portions (14) for connecting the respective interposed portions so as to hold said plurality of the rolling elements in an arranged condition such that they can roll, said plurality of rolling elements being thus composed into the form of a rolling element chain (BC) which is built into said full track, characterized in that said rolling element chain has two end portions which face each other within said full track and have a gap therebetween."

According to claim 1 of the first auxiliary request the sliding guide apparatus of the invention is "characterized in that said rolling element chain has two end portions which face each other within said full track and have a gap therebetween, said two end portions being unjoined with said gap therebetween when said rolling element chain circulates in said full track as said moving body moves along said track rail".

According to claim 1 of the second auxiliary request the sliding guide apparatus of the invention "is characterized in that said rolling element chain has two end portions which face each other within said full track and have a gap therebetween, said two end portions being unjoined with said gap therebetween wherein said rolling chain (BC) contains chamfered guiding portions (12a) at both ends thereof which are provided on said at least one resin connecting body (12) and which guide a circulation of said rolling chain in said full track".

III. The Appellant's arguments may be summarized as follows:

The characterizing feature of claim 1 according to the main request stating that (i) "said rolling element chain has two end portions which face each other within said full track and have a gap therebetween" was disclosed in the application as originally filed. This results from the overall disclosure of the application as published (EP-A1-846 880; henceforth indicated as EP-A1) as it emerges from the joint consideration of various parts of the same. To begin with, already in the introductory part of EP-A1 (column 1, lines 5-11) the essence of the invention is clearly stated, namely the provision of a "guide apparatus wherein an end-present rolling element chain for supporting a linear motion or rotary motion is inserted in a full track". The concept of an "end-present" chain indicates unambiguously that the chain of the invention, by contrast to an endless chain, has two distinct ends. The conventional endless chain including the rolling element cage or retainer having a plurality of pockets with the rolling elements located therein (EP-A1,

column 1, lines 40-43) is formed by injection molding (EP-A1, column 1, lines 51-54), both end portions being connected to form an endless chain after the ball chain has been mounted in a rolling path formed on the moving body (column 2, lines 4-8). If however, due to the ball diameter, a proper pre-pressure of the balls between the moving body and the stationary track rail and thus minimum rolling friction are not achieved, the connected end portions of the chain have to be released and the retainer including balls of a different diameter has to mounted again in the moving body and the opposite ends of the chain have to be connected anew (column 2, lines 9-45). The invention significantly simplifies the assembly of the ball chain on the sliding guide apparatus according to the "ball selective engagement method" heretofore described, since repeated connection and separation of the chain's ends is avoided (EP-A1, column 2, lines 7-8). Hence, given that the invention replaces the endless chain by an "end-present" chain, it would be pointless to have contacting ends, which would again make the assembling of the slide guide more cumbersome. In addition, the end portions of the retainer comprise chamfered guiding portions (EP-A1, column 4, lines 39-48) to ensure smooth movement of the ball chain (EP-A1, column 4, lines 47-48; column 7, lines 25-30), these guide portions being of particular significance since the end portions of the retainer are separated by the gap shown in figure 1. The need for these guiding means specifically arises in the U-formed parts of the track rail (EP-A1, column 4, lines 42-48) and this need is obviously related to the gap between the two end portions of the ball chain. In conclusion, feature (i) is to be seen as part of the technical teaching of the

invention as disclosed in the original application and does not contravene Article 123(2) EPC.
The deletion of the feature of the characterizing portion of claim 1 as granted stating (ii) "said two end portions being unjoined with said gap therebetween when said rolling element chain circulates in said full track as said moving body moves along said track rail" in claim 1 according to the present main request does not infringe Article 123(3) EPC. In fact, this feature directly ensues from above feature (i) since it is no more than a pure functional feature already implied by the constructional measures of feature (i). Hence feature (ii) does not give any further technical contribution to the subject-matter of claim 1 as granted and according to the decision G 1/93 (OJ EPO, 1994, 541; Reasons for the decision, point 11) such a feature having a non-limiting character can be deleted from the claim without violating Article 123(3) EPC.

Claim 1 according to the present first auxiliary request, corresponding to claim 1 as granted and including both said features (i) and (ii), likewise meets the requirements of Article 123(2) and 123(3) EPC. As set out above, feature (i) is clearly disclosed in the application as filed and feature (ii) is a functional feature implicitly derivable from feature (i). Even if feature (ii) were not to be regarded as disclosed in the application as filed, nevertheless it can remain in the claim, based on the principles of the decision G 1/93 mentioned above.

The subject-matter of claim 1 according to the second auxiliary request includes the further characterizing feature stating that (iii) "said two end portions being

unjoined with said gap therebetween wherein said rolling chain (BC) contains chamfered guiding portions (12a) at both ends thereof which are provided on said at least one resin connecting body (12) and which guide a circulation of said rolling chain in said full-track" replacing feature (ii). Feature (iii) is to be regarded as being equivalent to feature (ii) and moreover even as further limiting the scope of protection of granted claim 1. Hence the replacement of feature (ii) by feature (iii) does not infringe Article 123(3) EPC according to the further principles set out in G 1/93 (supra, Headnote, point 1; Reasons for the decision, point 13).

If the Board were to decide that Article 123(2) and 123(3) EPC did not prejudice maintenance of the patent on the basis of anyone of the aforesaid requests, then it is requested that the case be remitted to the first instance for further prosecution.

Concerning the third auxiliary request, since no decision has been taken on the subject-matter of the independent claim forming this request by the Opposition Division, it is requested that this request be remitted for further prosecution to the Opposition Division.

IV. The Respondent's arguments may be summarized as follows:

It is an undisputed fact that the ball chain according to the invention includes two separate end portions. However, there is no basis in the application as originally filed for the disclosure of a gap between these two end portions according to feature (i). The

essence of the invention as disclosed in the original application as filed merely resides in the fact that the end portions of the ball chain are not joined and the gap shown in figure 1 is not of any significance to the invention. Indeed, the skilled person would not even acknowledge the existence of the gap in figure 1 since the original application does not contain any further information relating to the existence of a gap. Such a gap is neither mentioned in the description or the claims, nor implicitly derivable from the overall disclosure of the invention. On the contrary, as shown in annex A1 submitted by the Respondent, in the case that the ball chain consists of a plurality of segments, the end portions of the different segments will inevitably contact each other at least during a limited time period when the ball chain circulates within the stationary track rail and the rolling groove formed in the moving body. The same holds true for a ball chain consisting of a single segment, since Annex 2 clearly shows that the inner parts of the opposite end portions of the ball chain may contact each other, particularly when these ends are moving in the U-shaped portion of the rolling path. Thus, the subject-matter of claim 1 according to the main request violates Article 123(2) EPC.

Further, the subject-matter of claim 1 according to the main request likewise contravenes Article 123(3) EPC, due to the cancellation of feature (ii), which is included in granted claim 1. This feature is not coterminous with feature (i), since it additionally requires that the gap between the end portions of the ball chain is constantly present during movement of the ball chain along the track rail and the rolling path.

Thus feature (ii) gives a technical contribution to the subject-matter of granted claim 1 and its deletion is therefore not allowed as clearly indicated in decision G 1/93 (supra).

The ground for opposition under Article 100(c) EPC 1973 prejudices the maintenance of the patent in the granted form according to the first auxiliary request, since granted claim 1 comprises both features (i) and (ii) which were not disclosed in the application as filed. Concerning feature (i), the reasons were already given above and insofar as feature (ii) is concerned, figure 1 of the application cannot by itself serve as a basis for the disclosure of this feature, given that this figure merely illustrates the ball chain at a particular moment and position in the track rail after its assembly in the slide guide apparatus. Hence no conclusions on the existence of a gap at all locations of the ball chain in the track rail during movement of the ball chain may be drawn from this sole figure. Quite to the contrary, on account of thermal expansion of the plastic retainer and absorption of chemicals or lubricating oil by the same, it is to be expected that, unless the gap is appropriately dimensioned, it will close under normal operating conditions of the sliding guide apparatus. This may also occur, as shown in Annex 2 and mentioned above, exclusively as a consequence of the specific geometry of the rolling path, given that when said end portions are moving in the curved portions of the rolling path the distance between the inner portions of the opposed ball chain's ends is less than the distance between their outer portions.

The replacement of feature (ii) by feature (iii) in claim 1 according to the second auxiliary request contravenes Article 123(3) EPC. In particular, these two features imply technical measures which are not equivalent and hence the mentioned replacement inevitably leads to a larger scope of protection. Further, as stated above, feature (i) of the claim contravenes the requirements of Article 123(2) EPC.

The Appellant's third auxiliary request should be remitted to the first instance, since no decision has been taken by the Opposition Division on the subject-matter of the sole independent claim of this request, which corresponds to granted independent claim 4 falling likewise within the extent of the opposition as filed.

Reasons for the Decision

1. The appeal is admissible.

2. With regard to the question whether or not feature (i) of claim 1 according to the Appellant's main request extends beyond the content of the application as filed (EP-A1), the Board notes at the outset that a gap between facing end portions of the ball chain can undoubtedly be seen in figure 1 of EP-A1. No other interpretation of this figure seems plausible. This is actually the only possible explicit source of disclosure of feature (i) in the entire application. However, it appears that the disclosure of figure 1, when considered in conjunction with the undisputed remaining part of feature (i), implying that the

rolling element chain has two end portions, clearly teaches the presence of a such a gap between the end portions of the rolling element chain, in particular when the ball chain and the moving body are at rest, after assembling the rolling element chain in the sliding guide apparatus, and hence not yet in operating conditions. There are several reasons why the absence of a gap, i.e. with both facing ends of the ball chain contacting each other, is excluded by the disclosure of EP-A1.

In the first place, as the Appellant has set out in detail, EP-A1 carefully describes the problems arising during assembly of the ball chain by said "ball selective engagement method" in the sliding guide apparatus in order to achieve an appropriate pre-pressure and sliding resistance to ensure an adequately smooth motion of the sliding guide. It is stated in EP-A1 (column 2, line 49-column 3, line 3) that in comparison to an endless chain the "end-present" rolling chain of the invention is easier to handle and to incorporate in the track of the sliding guide apparatus and that it avoids the complications arising with said pre-pressure and sliding resistance adjustment. Clearly, it is rather cumbersome to repeatedly mount the ball chain on the sliding guide and connect its end portions each time, as is necessary to test the pre-pressure and friction. Moreover, connecting the ends of the ball chain affects the pre-tension of the ball chain and thus also the sliding resistance since it provides an additional constraint on the balls, thus making the aforesaid "ball selective engagement method" more difficult. For all these reasons, in the "end-present" chain of the invention

the end portions of the ball chain are not connected since it is explicitly intended to circumvent the mentioned problems. As a consequence a gap is necessarily produced between the end portions of the ball chain, at least when the ball chain is mounted into the sliding guide, unless it is assumed that an alternative measure is provided according to the invention to bring the end portions of the ball chain into contact with each other. However, there is no disclosure of any technical measure of this kind in EP-A1, and a contact between the end portions of the ball chain does not come about by chance, which chance would be negligibly small, unless it is really intended by the invention. Further, any such measure would clearly be pointless and counterproductive, since it would again considerably complicate the mentioned "ball selective engagement method" thus eliminating the advantages achieved by the invention.

Finally the thermal expansion of the plastic retainer of the ball chain occurring under operating conditions has to be taken into account. Plastic materials also tend to deform during operation, and to expand due to absorption of chemicals or lubricating oil, as was pointed out by the Appellant itself during the granting procedure (see submission dated 5 July 2001). Hence the skilled person would understand, in order to at last partially compensate for the aforementioned effects, that a gap between the two end portions of the ball chain should be present on assembly. This feature can thus be considered as being disclosed by EP-A1 as part of its technical teaching.

The same applies of course likewise to the alternative included in claim 1 relating to the rolling element chain being formed of more than one segment, in particular when the chain and the moving body are at rest, after assembly of the ball chain in the sliding guide, and not yet in operating conditions.

The above reasons in conjunction with what is shown in figure 1 lead the Board to the conclusion that feature (i) constitutes part of the technical teaching of EP-A1 and is derivable from the overall disclosure of the application as filed in accordance with Article 123(2) EPC.

3. The mere cancellation of feature (ii), which was present in granted claim 1, is only to be allowed if the scope of protection is hereby not changed (Article 123(3) EPC). However, this is not possible if feature (ii) gives a technical contribution to the subject-matter of claim 1, feature (ii) thus being a limiting feature for the extent of protection of the claim (see G 1/93, supra, Reasons for the decision, point 13). In the view of the Board it cannot be denied that feature (ii) gives a technical contribution to claim 1 which is not derivable from the aforementioned feature (i). The reasons given under point 2 above make it plain that at least when the sliding guide is assembled and not yet in operation a gap exists between opposed end portions of the ball chain. However, as it may be equally inferred from point 2 above, on the sole basis of feature (i) no further statement can be made about the existence of the gap during operation of the sliding guide. In particular, it is obvious that during operation of the sliding guide apparatus the mentioned

physical effects (see point 2) will tend to close the gap, so that if no additional assumptions are made it is not possible to determine whether the gap between opposed end portions of the rolling element chain will still exist in all operating conditions as is implied by feature (ii). Consequently, feature (ii) constitutes a statement about the nature and/or size of the gap and thus makes a technical contribution to the subject-matter of the claim which is not derivable from feature (i) and which goes beyond its possible implications. As a result, the deletion of feature (ii) broadens the scope of protection of claim 1 of the Appellant's main request contrary to the requirements of Article 123(3) EPC. Thus the main request is not allowable.

4. Claim 1 according to the first auxiliary request corresponds to granted claim 1 and contains both said features (i) and (ii). The question is now whether feature (ii) was disclosed in the application as filed (EP-A1). There is no explicit support for this feature in EP-A1, and the Appellant itself merely alleges that feature (ii) is a functional feature which is implicitly derivable from the overall disclosure of EP-A1 and in particular from feature (i). The Board does not concur with the Appellant's view, since owing to the mentioned physical effects (see point 2) the gap will tend to close, and the application as filed gives no clue whatsoever, whether e.g. the size of the gap, the geometrical configuration of the plastic retainer of the rolling element chain and/or its constituent material are chosen such as to prevent the closure of the gap during the operation of the apparatus, or whether any other technical measure serving the same purpose is taken. In particular, feature (i) cannot be

considered as being a support for feature (ii), given that, as was already established earlier (see point 3), feature (ii) gives a technical contribution to the claimed subject-matter which goes well beyond the implications of feature (i).
In conclusion, feature (ii) was not disclosed in the original application as filed, and it is not a functional feature directly resulting from the structural measures already included in former feature (i) and giving no further technical contribution to the claimed subject-matter. Hence the ground for opposition under Article 100(c) EPC 1973 prejudices the maintenance of the patent as granted and therefore the first auxiliary request is not allowable.

5. In claim 1 of the second auxiliary request, feature (ii) has been replaced by the feature stating that (iii) "said two end portions being unjoined with said gap therebetween wherein said rolling chain (BC) contains chamfered guiding portions (12a) at both ends thereof which are provided on said at least one resin connecting body (12) and which guide a circulation of said rolling chain in said full-track". According to the principles laid down in G 1/93 (supra, Reasons for the decision, point 13) such a replacement is only to be allowed, if feature (ii) and (iii) could be regarded as being equivalent, or if this replacement would even further limit the claimed subject-matter, otherwise the extent of protection conferred by the claim would be broadened. However, it is apparent that above feature (iii), the same as feature (i), by no means entails that the gap between the end portions of the roller element chain exists during the operation of the sliding guide apparatus, as required by feature (ii).

In fact, in this respect feature (iii) does not contain any additional information to that already included in feature (i), and thus, on account of the reasons given under point 4, it does not include the technical contribution of feature (ii) either.
Consequently, contrary to the requirements of Article 123(3) EPC, the replacement of feature (ii) by feature (iii) leads to an extension of the protection conferred by claim 1. Thus the second auxiliary request is also not allowable.

6. Independent claim 1 of the third auxiliary request is based on granted claim 4. In view of the requests of the parties and given that no decision was taken during the opposition proceedings on the subject-matter of this claim, which relates to the same embodiment of the invention as granted claim 1, the Board, in accordance with Article 111(1) EPC 1973, decides to remit the case to the first instance for further prosecution on the basis of the third auxiliary request.

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 for further prosecution.

The Registrar: The Chairman:

A. Vottner S. Crane