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Datasheet for the decision of 11 September 2007

Case Number: T 1038/05 - 3.2.01

Application Number: 00302798.4

Publication Number: 1063438

IPC: F16C 29/06

Language of the proceedings: EN

Title of invention:
Linear motion guide unit

Patentee:
Nippon Thompson Co., Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56
EPC R. 67

Keyword:
"Inventive step (no)"
"Reimbursement of appeal fee (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1038/05 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 11 September 2007

Appellant: Nippon Thompson Co., Ltd.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 17 March 2005 refusing European application No. 00302798.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The European patent application No. 00302798.4 was refused with the decision of the Examining Division posted on 17 March 2005. The Examining Division decided that the subject-matter of claim 1 was not inventive (Article 56 EPC) in view of prior art documents D1 (JP-A-02 298 446) and D2 (EP-A-0 217 971). An appeal against this decision was filed by the Applicant on 6 May 2005 and the appeal fee was paid at the same time. The statement of grounds of appeal was filed on 15 July 2005. The Appellant requested that the patent be granted on the basis of a main request, or of one of auxiliary requests 1-3 as filed with the statement of grounds. Additionally, the Appellant requested reimbursement of the appeal fee on account of an alleged procedural violation.

II. The Appellant was summoned to oral proceedings. In a communication accompanying the summons the Board gave its provisional opinion that the subject-matter of claim 1 according to the main and to the auxiliary requests on file did not seem to involve an inventive step. Moreover, it was considered that no procedural violation had occurred.

III. In response to the Board's communication the Appellant informed the Board with letter of 30 July 2007 that it would not attend the oral proceedings and filed a new request withdrawing at the same time all previous requests.

Claim 1 according to the new request reads as follows:

" A linear motion guide unit, comprising a track rail (11) to be mounted to a bed (2) and having a pair of lengthwise side walls (13) connected to each other, and a slider (12) to be mounted to a table (3) movable relatively to the bed (2) so as to move lengthwise along the track rail (11) in a guiding way defined between the side walls (13) of the track rail (11), the track rail (11) having a bottom (14) interconnecting the widthwise opposing side walls (13) with each otherto define a recess (15) of U-shape in cross section of the track rail (11), thereby providing the guiding way along which the slider (12) moves in a sliding manner, and

the slider (12) having a slider head (50) not more than the guiding way in width and being movable in a sliding manner along the track rail (11) through rolling elements (30), which run through raceways (31) defined between first and second raceway grooves (17,24) confronting one another, the first raceway grooves (17) being formed on widthwise opposing inside surfaces (16) of the side walls (13) of the track rail (11), and the second raceway grooves (24) being formed on the slider (12) in confrontation with the first raceway grooves (17),

the slider (12) being comprised of a casing (20) made with the second raceway grooves (24), end caps (21) arranged on lengthwise opposing ends of the casing (20), one to each end, and end seals (22) arranged on the end caps (21),

the track rail (11) being provided with a first reference surface for mounting, which is adapted for coming into abutment against a mounting surface formed on the bed (2),

the first reference surface for mounting being composed of a reference side surface (27) formed on at least any one of the side walls of the track rail (11) so as to extend in parallel with a lengthwise direction of the track rail (11), and a reference bottom surface (28) formed on a bottom of the track rail (11) so as to extend in parallel with the lengthwise direction of the track rail (11);
the track rail (11) being adapted to be located with respect to the bed (2), with the reference side surface (27) and the reference bottom surface (28) being brought into abutment against a mounting side surface (4) and the mounting top surface (5) on the bed (2), respectively, and
characterized in that the slider head protrudes above top faces (18) of the side walls (13), the slider head (50) being provided with a second reference surface for mounting which is adapted for coming into abutment against a mounting surface formed on the table (3), the second reference surface for mounting being composed of a reference side surface (51) formed on at least any one of the sidewise opposing side surfaces (23) of the slider (12) so as to extend in parallel with a moving direction of the slider (12), and a reference top surface (53) formed on a top surface (52) of the slider (12) so as to extend in parallel with the moving direction of the slider (12),
the slider (12) being adapted to be located with respect to the table (3), with the reference side surface (51) and the reference top surface (53) being brought into abutment against a mounting side surface (57) and a mounting lower surface (58) on the table (3) repectively, wherein the slider head (50) protrudes above top faces (18) of the widthwise opposing side

walls (13) of the track rail (11) by an amount of distance (D) in a range of from 5 mm to 10 mm, and wherein the reference top surface (53) extends over only a part of the top surface (52) of the slider (12) and the reference side surface (51) extends over only a part of the side surface of the slider (12)."

IV. The Appellant's arguments submitted in writing may be summarized as follows:

The subject-matter of claim 1 has been delimited against closest prior art D1. D1 does not disclose reference surfaces on the top and side surfaces of the slider for mounting to a table having side and bottom mounting surfaces. In D1 the top surface has no reference points thereon and merely provides a flat surface which is substantially level with the top surfaces of the side walls of the track rail. D1 does not allow for reliable alignment of a stationary bed and a working table mounted on the slider. This problem has been solved in accordance with the invention by providing said reference surfaces for mounting the slider to a table having side and bottom mounting surfaces and by the slider head protruding above top surfaces of the opposing side walls of the track rail by an amount of distance in a range between 5 mm and 10 mm, wherein the reference top surface and the reference side surface extend over only a part of the top surface and of the side surface respectively of the slider. The mentioned distance is sufficient to ensure accurate location of the slider with respect to the table, while providing at the same time a compact arrangement which does not become de-stabilised by extending too far above the U-shaped trail. This leads, in conjunction

with said reference surfaces extending over only a part of said top and side surfaces of the slider, to an overall reduction in size and weight of the arrangement. There is no disclosure in D2 of the claimed combination of features and especially of a side reference surface extending over only a part of the side surface of the slider. Finally, D2 deals with the problem of reducing friction in the rolling elements, which is quite different from that of the invention and D2 also does not relate to a U-shaped track but to an I-shaped track, the problem of alignment relevant to the present invention thus not being evident in D2. Hence the combination of D1 and D2 would not be obvious for the skilled person.

V. Oral proceedings were held on 11 September 2007 in the absence of the duly summoned Appellant (Rule 71(2) EPC). After deliberation, the Board's decision was announced at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible since it meets the requirements of Articles 106 to 108 EPC in conjunction with Rule 64 EPC.

2. Document D1 represents the closest prior art and undisputedly discloses all the features of the preamble of claim 1. Additionally D1 likewise shows (see figures 1,16) a reference top surface formed on a top surface of the slider (3), provided with threaded holes (9) into which fixing bolts are screwed to mount a table

(not shown). Therefore the reference top surface of the slider is brought into abutment with a mounting lower surface on the table. Consequently, the only differences to D1 consist in that according to claim 1 (i) the slider is provided with a reference side surface being brought into abutment with a mounting side surface on the table, in that (ii) the slider protrudes above top surfaces of the side walls of the track rail by an amount of distance D in a range of from 5 mm to 10 mm, and in that (iii) the reference top surface and the reference side surface extend respectively over only a part of the top surface and over only a part of the side surface of the slider.

3. The object of the invention as arising from the above mentioned differences and derivable from the published patent application (column 3, lines 36-45) may be seen in improving the alignment of working table and slider, as well as of the track rail and the bed, whereby the bed and the working table are accurately kept in the desired relative orientation. The skilled person would first of all look into the prior art relating to the same technical field, such as for instance D2, which discloses a linear motion guide unit having a slider to be mounted to a working table and guided on a track rail to be fixed on a bed. Fig. 4 in D2 illustrates that in addition to the top surface of the slider mounted to the working table, the side surface of the slider likewise provides a mounting surface which comes into abutment with a side surface of the working table. This side surface of the slider extends, as does the top surface thereof, in a direction parallel to the moving direction of the slider, and constitutes a means by which alignment of the working table and of the

slider is improved, since by means of additional side mounting surfaces providing additional constraints the alignment position is more accurately defined. This would be evident to the skilled person and moreover this feature appears to be equally known from the prior art cited in the present published application (Fig. 8,9; column 2, lines 18-24).

The combination of D1 and D2 appears thus to be obvious and the remaining features (ii) and (iii) apparently include nothing more than appropriate instructions for the implementation of feature (i).

Insofar as the appropriate implementation of feature (i) lies within the capabilities of the person skilled in the art, features (ii) and (iii) cannot justify an inventive step either. In particular, in order to minimize weight and size of the guide unit it would be obvious to have said slider head protruding only by a small amount of distance D above the top faces of the side walls of the track rails and to have said top and side reference surfaces extending only partly over the top and side surfaces of the slider, as shown for instance in fig. 4 of D2. Thus, optimum ranges of parameters (for example 5 to 10 mm for the distance D) would clearly be chosen by the skilled person according to common design procedures and known criteria.

Moreover, choosing said amount of distance D to be small results in the table being positioned as low as possible therefore contributing to stability of the guide unit. On the other hand, given that said reference side and top surfaces extend only partly over the top and side surfaces of the slider the

manufacturing costs for these reference surfaces which have to be machined with a high precision are also lowered.

All in all, for the given reasons the combination of D1 with D2 would be obvious for a person of ordinary skill in the art and in conjunction with the usual capabilities of the skilled person this combination would lead to the subject-matter of claim 1.

4. The arguments presented by the appellant were not found to be convincing by the Board. In the first place, even though admittedly D2 and the prior art mentioned in the present patent application (fig. 8,9) relate to linear motion guide units having an I-shaped track rail, nevertheless the problem of accurate alignment of the bed and the working table, albeit not mentioned, is inherently present in the guide units of D2 since the positioning accuracy is of vital importance in almost any technical field of application. In fact, in D2 and in the prior art cited in the application (fig. 8,9) this problem has clearly been solved by providing reference top and reference side surfaces on the slider to be mounted to corresponding mounting lower and mounting side surfaces on the working table. It is not to be seen why the same measures would not be applied by the person skilled in the art with the same results to a guide unit having a U-shaped track rail, given that proper alignment of the slider and the working table does not depend on the shape of the track rail. Secondly, the advantages set out under point 3 above, as mentioned also by the applicant, obtained through said measures (ii) and (iii), are in fact, as considered under point 3 above, nothing else but common

objects which the skilled person would generally try to achieve when designing the guide unit, these objects being, among others, stability of the guide unit, reduced weight and size, and minimum costs. Thus, achieving these known objects by means of said obvious design measures (ii) and (iii) would be part of the customary practice of the skilled person.

5. In view of the above, the subject-matter of claim 1 lacks an inventive step, thus not meeting the requirements of Articles 52(1) and 56 EPC. The Appellant's request can therefore not be allowed.

6. Given that, for the reasons set out above, the appeal is not allowable, the requirements of Rule 67 EPC are not fulfilled in the present case. Therefore, the reimbursement of the appeal fee cannot be ordered.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

2. The request for reimbursement of the appeal fee is refused.

The registrar: The Chairman:

A. Vottner S. Crane