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**Datasheet for the decision
of 22 September 2009**

Case Number: T 0354/08 - 3.2.04

Application Number: 02075543.5

Publication Number: 1230872

IPC: A47B 9/04

Language of the proceedings: EN

Title of invention:

Lifting column preferably for furniture such as tables and beds

Patentee:

LINAK A/S

Opponent:

Dewert Antriebs- und Systemtechnik GmbH & Co. KG

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 123(2)

Relevant legal provisions (EPC 1973):

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Keyword:

"Novelty - enabling disclosure (yes)"

"Novelty - (no) (main request)"

"Amendments - added subject-matter (yes) (auxiliary requests)"

Decisions cited:

T 1067/97, T 0025/03

Catchword:

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Case Number: T 0354/08 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 22 September 2009

Appellant:
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 14 December 2007
revoking European patent No. 1230872 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: M. Ceyte
Members: A. de Vries
C. Heath

Summary of Facts and Submissions

I. On 13 February 2008 the Appellant (Proprietor) lodged an appeal against the Opposition Division's decision of 14 December 2007 to revoke European patent no. 1 230 872 and simultaneously paid the prescribed appeal fee. The grounds of appeal were filed on 14 April 2008.

Opposition was filed against the patent as a whole and based on Article 100(a) EPC in combination with Articles 54 and 56 for lack of novelty and inventive step.

The Opposition Division held that these grounds prejudiced maintenance of the patent in view of the following document in particular:

D4 : US-A-5 937 699

II. The Appellant (Proprietor) requests, as a main request, that the decision under appeal be set aside and the patent be maintained as granted, or, in the alternative, it be maintained in amended form according to an auxiliary request 1 filed with the grounds of appeal, or a further auxiliary request 2 filed during the oral proceedings before the Board.

The Respondent (Opponent) requests that the appeal be dismissed.

III. Oral proceedings before the Board were duly held on 22 September 2009.

IV. The wording of claim 1 of the requests is as follows:

Main request

"A lifting column, in particular for furniture, such as tables and beds, comprising at least two mutually telescopically slidable members (1, 2) which are formed by rigid tube profiles, preferably extruded aluminium profiles, a spindle (4) in one member (1), and have arranged thereon a spindle nut (8), a reversible electric motor (6), a power supply (21) and control electronics (22) as well as an operating panel, whereby the spindle (4) is secured at the end of one member (1), the spindle nut (8) is connected with the adjacent end of the other member (2), characterized in that the spindle nut (8) may be caused to rotate by the motor (6) via a transmission (7) to bring about the telescopic displacement of the members (1,2)."

Auxiliary Request 1

"A lifting column for furniture, such as tables and beds, comprising at least two mutually telescopically slidable members (1,2;30,32) which are formed by rigid tube profiles, preferably extruded aluminium profiles, a spindle (4) a first member (1;30), and have arranged thereon, a spindle nut (8), a reversible electric motor (6), a power supply (21) and control electronics (22) as well as an operating panel, and wherein the spindle (4) is fixedly secured at one end of the first member (1 ;30), that the spindle nut (8) is connected with the adjacent end of the second member (2;32), and that the spindle nut (8) may be caused to rotate by the motor (6)

via a transmission (7) to bring about the telescopic displacement of the members (1, 2), characterized in that the second member (2;32) is having a cross section that is smaller than the cross section of the first member (1 ;30), and that there is an end bottom (5) that forms a chassis for the motor (6) and the transmission (7) and that the bottom (5) is arranged in the second member (2;32) in the adjacent end thereof."

Auxiliary Request 2

Claim 1 is as in auxiliary request 1 but for the following changes (with emphasis added to highlight what has changed):

- "first member" is replaced by "*one* member" throughout;
- "second member" is replaced by "*other* member" throughout;
- the final feature now reads "that there is an end bottom *formed by two half shells (5a,5b)* that forms a chassis ..."

V. The Appellant argued as follows :

The embodiments of figure 2 and 3 of D4 relied on as prior art are not enabled. It is in particular unclear how both nut 27 and its spindle 26 can be rotated to produce axial displacement. The two movements contradict each other. Column 3, lines 50 to 59 fail to clarify its functioning. Additionally, column 2, lines 45 to 52, identifies a "higher than expected friction" in the prior art arrangement of figure 1.

Friction is compounded in the double drive train system, and it will lock even sooner.

The added feature of smaller and larger cross-sections (auxiliary request 1) may not be expressly mentioned in the original text, in particular paragraph [0017]. Nevertheless, it can be inferred from figure 1. This paragraph also provides the basis for the feature of the end bottom.

As for the features added in the auxiliary request 2, these derive from the text corresponding to specification paragraph [0019].

VI. The Respondent argued as follows :

It is clear from the final paragraph of column 3 of D4, as well as from column 4, lines 40 to 47, that the amount of translation depends on the gear ratios of the two drive trains, via screw 26 and grooved shaft 30. These will be optimized to produce the desired translation rate. Measurement of the relative sizes of the gears in figure 3 shows a reduction in gear ratio of the drive of screw 26a via shaft 30a, so that screw 26a rotates slower than its corresponding nut. Both rotate but at different speeds giving a net translation of the screw with respect to the nut. D4 is thus sufficiently clear and constitutes prior art prejudicial to novelty. Friction can be managed and is no practical impediment.

Indicating that the members have smaller, respectively larger cross-sections is not the same as specifying them to be telescopically mounted inner and outer

members, as does the original passage of the description corresponding to specification paragraph [0017]. The term "cross-section" has no clear basis in the original disclosure and could refer to the material cross-section.

The passage corresponding to paragraph [0019] cited as basis for the features added to claim 1 of the auxiliary request 2 also mentions other features, such as the dividing line, which have not be incorporated into claim 1. Isolating features from their context results in added subject-matter.

Reasons for the Decision

1. The appeal is admissible.
2. *Main Request : Enabling prior art & Novelty*
 - 2.1 D4, figures 2 and 3, in conjunction with column 3, line 26, to column 4, line 47, discloses a telescopic lifting column in which telescoping movement is transmitted via a screw and nut drive train. Referring to figure 2, at the top of each stage is a geared nut 27, which is driven (from motor 40) to rotate with respect to its screw 26 secured to the top of the *next* stage via a rotatably seated screw gear 28. D4 now proposes a second parallel drive train which transmits rotation simultaneously to all stages. This further drive train includes, for each stage, a geared bushing 32 meshing with the nut 27 of that stage, which imparts rotation to a splined shaft 30 with integral shaft gear 31 seated at the top of the next stage. The shaft gear

31 meshes with the screw gear 31 also seated there, which in turn meshes with the bushing and geared nut for the *following* stage. The lowermost nut and bushing are driven by a motor 40 under the control of appropriate control means with an implicit control panel, cf. column 4, lines 4 to 6.

In the alternative embodiment figure 3, the screws are realized coaxially and each bear screw gears 27b, 27c that double as nut for the next stage. Likewise, the splined shafts 30a, 30b, have a common axis, each having a shaft gear 32b, 32c which also acts as bushing gear for the next stage, see further column 4, lines 17 to 47.

- 2.2 The Appellant does not dispute that all features of claim 1 - in particular the central feature of the spindle nut being driven to rotate - are derivable from either embodiment. However, he contends that these embodiments cannot be realized, so that D4 is not enabling and must be disregarded as prior art.

- 2.3 Initially, see grounds, page 2/5, first paragraph, the contention was that the rotation of the nut 27 by motor 40 and that of the corresponding spindle or screw 26 via bushing 34, shaft 30, shaft gear 31 and screw gear 28 contradict each other. This paragraph concludes: "For axial displacement of the spindle, it should be fixed in a non-rotating manner".
 - 2.3.1 It is correctly observed that both spindle (or screw) 26 and its nut are rotated. From the figure it is clear that if, say, nut 27 is rotated clockwise, bushing 39, and with it shaft 30 and shaft gear 31 will be rotated

counter-clockwise, imparting clockwise rotation to screw gear 28 and shaft 26. This is also expressly stated in D4 itself, in column 3, lines 59 to 60, ("..rotations of the nuts 27 and screws 26 ..."); and column 4, lines 41 to 42 ("... rotations of the motor transmitted both to all the screws and all the nuts ...").

- 2.3.2 However, simultaneous movement of nut and screw is by no means contradictory. For translational movement of the screw to take place there must be *relative* rotation of the nut with respect to the screw. Screw and nut must thus rotate by *different* amounts or angles to produce any screwing action. This is what is meant when D4, in column 4, lines 39 to 43, states that "this variant [the embodiment of figure 3] functions in roughly the same way as the previous variant [that of figure 2], due to rotations of the motor transmitted both to all the screws and all the nuts and *with different angles between the screws and nuts in order to produce a screwing and a translation of the modules*" (emphasis added by the Board). The different angles are realized by setting appropriate gear ratios, as again expressly stated in column 3, lines 59 to 61, of D4: "As the rotations of the nuts 27 and the screws 26 are all imposed *by gear tooth ratios*, the translations of the screws and therefore the tubes are also subject to this condition [i.e. the gear tooth ratio]" (emphasis again added). In the further embodiment of figures 4 and 5, for example, where screw and splined shaft are unified in a single splined and threaded screw 26, but which otherwise has the same basic design, a "reduction gear train" operates between nut 57 and bushing 58, column 4, lines 60 to 62, i.e. the rotation

transmitted to the screw is reduced with respect to that transmitted to the nut.

2.3.3 In as far as this would not already be clear to the skilled person from simple mechanics, D4 thus specifically teaches him to rotate *both* nut and screw, but by different angles, to produce the desired movement. This is achieved by appropriate gear ratios, specifically gear reduction. The particular gear ratio, however, will depend on the particular requirements and can be determined by routine design procedure. The Board does not doubt that this teaching is sound and feasible.

2.4 Nor does it believe that friction represents an insurmountable obstacle to putting D4's teaching into practice, as subsequently argued by the Appellant in reference to column 2, lines 45 to 52 and figure 1. That passage describes a prior art telescopic lifting design which relies on locking of a driven screw 2 and a rotatably seated nut 5 to transmit rotation to subsequent stages. Only when nut 5 reaches a stop 8,9 at the end of the screw does it lock with the screw to start rotating with it and so impart rotation to the screw of the next stage, and so on, see column 2, lines 41 to 45. The stages extend sequentially, from the lowest stage upwards. The screw parameters (thread pitch and shape, tolerances between nut and screw) will be optimized to produce the desired locking, meaning that the design may also be susceptible to premature locking if a "higher than expected friction" occurs between the nut and screw in between stops, as described in lines 45 to 52 of column 2. Rotation is then imparted to the upper stages much sooner, before

full extension of a lower stage. Once the upper stages are fully extended and lock, their locking acts (in the reverse direction) to overcome the friction in the lower stage and unlocks it so its movement can resume. This premature locking results in irregular and unforeseeable movement of the column, as noted in concluding lines 57 and 58 of column 2.

2.4.1 D4 effectively solves this problem by using an alternative approach that does not rely on locking to transmit rotation between stages. Thus, drive is *continuously* transmitted to *each* stage - via bushings 32, shafts 30 and shaft gears 31 - to both nut and screw of each stage. During operation *all* elements rotate providing a more continuous and distributed movement. Naturally, locking of nut and screw might still occur, in this case with disastrous consequences, if, for example, the screw parameters have been poorly chosen, or the column is not properly serviced or operated. This does not mean that the design is not practicable. It merely means that the skilled person must choose the various parameters carefully and ensure regular maintenance and proper operation. The Board is again in no doubt that the skilled person, a mechanical engineer with an understanding of the kinematics involved, will know exactly what to do and how to do it. To find the appropriate parameters, he would, for example, use routine trial and error, or, alternatively, straightforward mechanical analysis and calculations.

2.5 The Board concludes that D4 provides the skilled person with sufficient information to successfully reproduce its teaching. It thus constitutes valid prior art for assessing novelty. As the Board has no reason to depart

from the appealed decision's finding of lack of novelty, that finding is upheld.

3. *Auxiliary requests : added subject-matter*

3.1 Claim 1 of the *auxiliary request 1* among other amendments to claim 1 of the main request also adds features of the second (or other) member having a cross-section smaller than that of the first member, and of an end bottom forming a chassis for the motor and transmission in the bottom of the second member.

3.1.1 These features are introduced from the description, in particular the paragraph bridging pages 4 and 5 of the description as filed, corresponding to specification paragraph [0017].

This paragraph starts off by indicating that "the column comprises an outer tube 1 and an inner tube 2 telescopically mounted in the outer tube". Though one tube (the inner) being mounted in the other (outer) tube implies the inner has a smaller cross-section, the converse is not true. A tube having a smaller cross-section than an other tube does not mean that it is mounted within the other, nor does it exclude the possibility of the one tube also having an area where the cross-section is *larger* than the other. The present formulation encompasses these possibilities and is thus broader than the original formulation. This generalization extends beyond the content of the original disclosure as regards this specific feature.

3.1.2 The Board adds that the added features also appear together with other features in the cited passage - e.g.

those of a double worm gear transmission between motor and spindle, the end bottom chassis also housing the nut - not incorporated in claim 1. All these features are functionally and structurally related in that, for example, they contribute to that embodiment's compact design, cf. specification paragraph [0022]. Lifting some features out of this functional context, and omitting others, also represents a generalization of this specific embodiment for which there is no clear basis in the original disclosure, see further T 1067/97 and T 0025/03 mentioned on pages 240 and 241 of the Case Law of the Boards of Appeal, 2006, 5th (English) Edition.

- 3.1.3 The Board reaches a similar conclusion if the figures are invoked as basis. Though of rough schematic nature, these still define specific functional and structural relationships between the various features shown. Raising some of these to prominence above others, and out of their functional and structural context, presents the skilled person with new information.
- 3.2 The same features of smaller cross-section and of the end bottom also appear in claim 1 of *auxiliary request 2* outside of their original context, and these amendments add subject-matter for the reasons given above. In addition claim 1 of the *auxiliary request 2* adds further features requiring the end bottom to be formed of two half shells. These features are incorporated from the paragraph bridging pages 5 and 6 of the description as filed, corresponding to specification paragraph [0019]. That paragraph also specifies that the half shells have a dividing line extending through the spindle and motor shafts, and

that the end bottom passes like a plug into the end of the inner tube and has an annular flange 17 engaging with the tube. The end bottom thus described has a specific structure of interrelated features, the only such specific structure described in the application as filed. As above, lifting only selected features from that specific context results in a generalization of a specific teaching which lacks a basis in the original disclosure.

- 3.3 The Board concludes that the amendments to claim 1 according to either auxiliary request 1 or 2 add subject-matter extending beyond the content of the application as filed, contrary to the requirements of Article 123(2) EPC.

4. *Conclusion*

The Board finds that the opposition ground of novelty prejudices maintenance of the patent as granted (main request). Moreover, taking into account the amendments made to claim 1 according to auxiliary requests 1 and 2, the patent as amended fails to meet the requirements of Article 123(2) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

G. Magouliotis

M. Ceyte