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**Datasheet for the decision
of 15 November 2022**

Case Number: T 2220/18 - 3.2.06

Application Number: 13154456.1

Publication Number: 2628698

IPC: B66B7/06, B66B7/12

Language of the proceedings: EN

Title of invention:

A rope of a lifting device, an elevator and a method for manufacturing the rope

Patent Proprietor:

Kone Corporation

Opponent:

TK Elevator Innovation and Operations GmbH

Headword:

Relevant legal provisions:

EPC Art. 83, 84, 56

Keyword:

Sufficiency of disclosure - (yes)
Claims - clarity after amendment (yes)
Inventive step - (yes)

Decisions cited:

G 0003/14, T 1018/05, T 0006/01, T 0165/84, T 0623/91,
T 1326/08

Catchword:



Beschwerdekammern

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Case Number: T 2220/18 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 15 November 2022

Appellant: Kone Corporation
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
13 August 2018 concerning maintenance of the
European Patent No. 2628698 in amended form.**

Composition of the Board:

Chairman M. Hannam
Members: M. Dorfstätter
W. Ungler

Summary of Facts and Submissions

- I. In its interlocutory decision the opposition division found that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, the European patent No. 2 628 698 met the requirements of the EPC.
- II. Appeals were filed by both the proprietor and the opponent. As both parties have appealed, they will be referred to in the following as "proprietor" and "opponent".
- III. The following documents are of relevance for this decision:
- | | |
|----|----------------------|
| E1 | WO 2011/029 726 A2 |
| E2 | EP 1 886 795 A1 |
| E4 | US 2008/0 087 500 A1 |
- IV. The proprietor requested that the decision under appeal be set aside and the patent be maintained as granted (main request), or that the patent be maintained on the basis of one of auxiliary requests I to VII filed with the statement of grounds of appeal.
- V. The opponent requested that the decision under appeal be set aside and the patent be revoked.
- VI. The Board issued a summons to oral proceedings and a subsequent communication in which it gave its provisional opinion.

- VII. In a written submission the opponent indicated that it would not attend the oral proceedings and asked for a decision according to the state of the file to be taken.
- VIII. Oral proceedings took place in the absence of the opponent. During the oral proceedings the proprietor withdrew all its requests on file and submitted a corrected auxiliary request IV (the correction consisting of a corrected back-reference in claim 8 only) and amended pages 2 and 6 of the description.
- IX. The final request of the proprietor was thus that the decision under appeal be set aside and the patent be maintained on the basis of auxiliary request IV as filed during the oral proceedings before the Board.

With the opponent not taking part in the oral proceedings, its final requests remained as before.

- X. Claim 1 of auxiliary request IV reads as follows:

"Rope (R) of a lifting device, more particularly of a passenger transport elevator and/or freight transport elevator, which rope comprises an unbroken load-bearing part (P), the cross-section of which is essentially of rectangular shape, and the width of the cross-section is greater than the thickness and which load-bearing part comprises glass fiber reinforcements and/or aramid fiber reinforcements and/or carbon fiber reinforcements and/or polybenzoxazole fiber reinforcements and/or polyethylene fiber reinforcements and/or nylon fiber reinforcements in a polymer matrix material, wherein the aforementioned unbroken load-bearing part (P) is coated with an unbroken coating material (C), which is a polymer, preferably a high-friction elastomer, e.g.

polyurethane and wherein one or more long sides of the cross-section of the load-bearing part (P) comprise symmetrically or asymmetrically in the longitudinal direction of the rope one or more grooves (G), which divide the load-bearing part into smaller parts (P1, P2, ..., PM), whereby the depth in the thickness direction of the cross-section of the one or more grooves (G) made in the one or more long sides of the cross-section of the aforementioned load-bearing part is 0.5-2 mm, more preferably 1-1.5 mm, and the aforementioned groove (G) is V-groove shaped, the V-angle (α) being preferably 15-40 degrees, more preferably 25-30 degrees, and whereby the proportion by volume of the reinforcements of the aforementioned load-bearing part of the rope is at least 60 per cent by volume reinforcing fibers in the load-bearing part."

XI. Claim 11 of auxiliary request IV reads as follows:

"Method for manufacturing a rope (R) of a lifting device, more particularly of a passenger transport elevator and/or freight transport elevator, which rope comprises an unbroken load-bearing part (P), the cross-section of which is essentially of rectangular shape, and the width of the cross-section is greater than the thickness and which load-bearing part comprises glass fiber reinforcements and/or aramid fiber reinforcements and/or carbon fiber reinforcements and/or polybenzoxazole fiber reinforcements and/or polyethylene fiber reinforcements and/or nylon fiber reinforcements in a polymer matrix material, whereby the unbroken load-bearing part (P) is coated with an unbroken coating material (C), which is preferably a high-friction elastomer, e.g. polyurethane and whereby one or more grooves (G) are made symmetrically or asymmetrically in the longitudinal direction of the

rope on one or more long sides of the cross-section of the load-bearing part (P), which grooves divide the load-bearing part (P) into smaller parts (P1, P2, ..., PM), wherein the depth in the thickness direction of the cross-section of the one or more grooves (G) made in the long sides of the cross-section of the aforementioned load-bearing part (P) is 0.5-2 mm, more preferably 1-1.5 mm, and the aforementioned groove (G) is V-groove shaped, the V-angle (α) being preferably 15-40 degrees, more preferably 25-30 degrees, and wherein the proportion by volume of the reinforcements of the aforementioned load-bearing part of the rope is at least 60 per cent by volume reinforcing fibers in the load-bearing part and wherein the groove is V-shaped."

XII. The proprietor's arguments relevant to the decision may be summarised as follows:

The open-ended range of "at least 60 per cent by volume" was clear and sufficiently disclosed. The skilled person would exclude a value of 100 per cent as this made technically no sense.

The subject-matter of claim 1 of auxiliary request IV involved an inventive step. E1 did not show a coating in the sense of the patent. Furthermore, the skilled person had no incentive to change the shape of the grooves from being U-shaped to V-shaped.

XIII. The opponent's arguments relevant to the decision may be summarised as follows:

The open-ended range of "at least 60 per cent by volume" lacked clarity and was not disclosed in a manner sufficiently clear and complete for a skilled

person to carry out the invention because it was impossible to find a meaningful upper limit.

The subject-matter of claim 1 of auxiliary request IV did not involve an inventive step. The embodiment of Figure 4 of E1 already comprised a sheath which was to be considered a coating. Starting from E1, the skilled person would solve the two partial problems to achieve a high tensile strength and to adapt the rope to the shape of a given guide pulley. They would increase the fiber content and change the grooves to have a V-shape without exercising an inventive step.

Reasons for the Decision

1. *Articles 83 and 84 EPC*

Claim 1 of auxiliary request IV (the sole request of the proprietor at the end of the oral proceedings) corresponds to a combination of claims 1 and 2 as granted, with the additional limitation that "the proportion by volume of the reinforcements of the aforementioned load-bearing part of the rope is at least 60 per cent by volume reinforcing fibers in the load-bearing part."

Against this request, the opponent, in its written submissions, explicitly invoked only a lack of inventive step. The Board also sees no other problems. In particular, the Board is satisfied that the requirements of Articles 83 and 84 EPC are complied with.

1.1 As regards Article 84 EPC, it is noted that its requirements are up for debate only for the limitation

relating to the volume percent of reinforcing fibers. The remainder of claim 1 literally corresponds to a combination of claims 1 and 2 as granted. Therefore, the present claim 1 may be examined for compliance with the requirements of Article 84 EPC only to the extent that the amendment introduces non-compliance with Article 84 EPC (see G3/14). The combination of granted claims 1 and 2 cannot "introduce" a non-compliance, as this non-compliance would have been already present in the set of claims as granted.

1.2 In view of the further added feature of "at least 60 per cent by volume", the opponent argued in the context of the now withdrawn auxiliary request II that it was impossible to find a meaningful upper limit for the proportion by volume of the reinforcements and that claim 1 therefore lacked clarity and sufficiency of disclosure. This is however not accepted. As also indicated in its communication (see item 3.2), the Board considers the open-ended range to be in conflict with neither Articles 83 nor 84 EPC. A skilled person would construe the claim as not extending to those variants which they immediately exclude as being clearly outside the scope of practical application (see T1018/05, Reasons 2.3). The Board is thus satisfied that the exact distinctions which delimit the scope of protection are clear from claim 1, the lower limit being a proportion of 60 per cent by volume, the upper limit being defined by the maximum fibre content that is practically applicable.

1.3 The opponent cited several decisions to support its view that claim 1 lacked both clarity and sufficiency. As explained here below, however, the decisions cited by the opponent do not support its point of view. The arguments based thereon are not convincing.

- 1.3.1 In T6/01 (Reasons 14 to 16) the board found that the formulation "mehrere Wochen" was unclear because it could not be determined whether it also included only two weeks. It was thus the ill-defined lower limit that was found unclear, not the lack of an upper limit.
- 1.3.2 T6/01 refers to T165/84 (the other decision cited by the opponent with regard to Article 84 EPC). In its communication in T165/84, the Board objected a lack of clarity against claim 8 as underlying the examining division's decision (see facts and submissions IV). The appellant then submitted amended claims which were finally dismissed as contravening Article 123(2) EPC. Claim 8 as considered to lack clarity did however not include an open-ended range. It was the unspecified features of "variations in vacuum" and a "change of depth" for which the Board did not accept that a skilled person could delimit their magnitude without further provisions in the claim.
- 1.3.3 With reference to T623/91 and T1326/08, the opponent argued that if a particular effect was relied upon for patentability, the skilled person had to be able to achieve it over the whole claimed range. This argument regarding sufficiency of disclosure is not convincing for several reasons.

Firstly, T623/91 (Reasons 2.1, page 6, first full paragraph) referred to an effect relied upon for patentability (i.e. in the context of the requirements of novelty, inventive step and industrial applicability) and not for clarity or sufficiency of disclosure. Secondly, and as explained above, the Board considers the claimed range to be limited by its practical application. Any proportion by volume of the

reinforcements above this practical limit would thus also be outside of the claimed range. And thirdly, in the present case no technical effect is claimed that is achieved by the proportion within the open-ended range of at least 60 per cent by volume. In order to be able to carry out the invention as defined in claim 1, the skilled person does not need to achieve a particular effect that is not claimed.

1.3.4 The latter also applies to T1326/08 in which the effect that the mixture was "synergistic" was explicitly claimed. It could however not be proven that this effect was achieved over the full breadth of ratios claimed (see Reasons 3).

1.4 The Board has thus no reason to deviate from the long-standing case law as set out in T1018/05, Reasons 2.3. Neither has it a reason to change its preliminary opinion as given in its communication and confirms it herewith. The requirements of Articles 83 and 84 EPC are thus fulfilled with respect to both claims 1 and 11.

2. *Article 56 EPC - inventive step*

The subject-matter of claims 1 and 11 involves an inventive step (Article 56 EPC). Starting from E1 the skilled person has no incentive to amend the shape of the grooves from a U-shape to a V-shape, in particular in combination with raising the proportion by volume of the reinforcements to at least 60 per cent. The same applies when starting from E2, in which case there is no incentive to apply V-shaped grooves in the load-bearing parts at all.

- 2.1 With reference to Figure 4, E1 describes a rope of a lifting device comprising an unbroken load-bearing part, the cross-section of which is of essentially rectangular shape. It comprises carbon filaments in a polymer matrix material. Two grooves are provided in the longitudinal direction of the rope, which grooves divide the load-bearing part into smaller parts. This was, at least during the oral proceedings before the Board, not contested by the proprietor.
- 2.1.1 Figure 4 in E1 does not explicitly depict a coating. However, the general statement in the description (page 8, first full paragraph) that the rope can comprise a sheath ("Ummantelung") which is preferably made of plastic material, is interpreted by the Board as relating not least to the Figure 4 embodiment. The statement forms part of the general part of the description. The Board has no doubt that, in this particular case, the sheath is an element that is separately discussed in order to show that it can be, and if need be shall be, combined with the embodiment of Figure 4.
- 2.1.2 The proprietor argued that Figure 4 of E1 represented an embodiment that is to be considered as it is shown, and that no further features should be read into it. This is however not accepted for the particular disclosure of E1. The statement on page 8 of E1 not only mentions a sheath, but also refers to the reason for it, namely to protect the rope against outer mechanical impacts ("[u]m das Seil gegen äußere Einflüsse zu schützen"). A skilled person would thus understand that the Figure 4 embodiment includes a sheath if a need to protect it were to arise.

2.1.3 The proprietor further argued that a sheath ("Ummantelung") was different from a coating. A sheath was to be understood as being physically separate from that which it sheathed, whilst a coating was bonded to the underlying material. Furthermore, in paragraph [0015] of the contested patent the function of the polymer coating was described as to keep the belt-type rope together if the load-bearing part were to split after having been loaded. The coating in the sense of the patent thus had to be of a certain thickness. The proprietor thus considered that E1 did not show a coating. These arguments are not persuasive either.

The Board interprets claim 1 in its broadest technically reasonable meaning. It rules out interpretations which are illogical or which do not make technical sense. The Board considers the term "coated" as used in claim 1 to be of an unspecific nature and thus as embracing all sorts of coverings and thus also the sheath as described in E1. This interpretation is neither illogical nor does it fail to make technical sense. Having reached a technically meaningful interpretation, the mention in the description of a specific preferred function of a feature defined in a claim in generic terms cannot alter the understanding of the general feature in the claim. Furthermore, if a term used in a claim has a clear technical meaning, there is no need to refer to the description for purposes of interpreting such a term in a different, let alone more limited, way. This is also well established case law of the Boards of Appeal (see Case Law of the Boards of Appeal, 10th edition 2022, II.A.6.3.4).

2.1.4 The Board therefore concludes that a coating is already disclosed in E1 in combination with the Figure 4

embodiment. There is thus no need for a skilled person to consult E4 to learn that protective layers can be applied to a rope.

2.2 The subject-matter of claim 1 thus differs from E1 by a particular depth and shape of the groove, and by the fibre content being of at least 60% by volume. More precisely, it differs in that

- the depth in the thickness direction of the cross-section of the one or more grooves (G) made in the one or more long sides of the cross-section of the aforementioned load-bearing part is 0.5-2 mm, more preferably 1-1.5 mm,
- and the aforementioned groove (G) is V-groove shaped, the V-angle (α) being preferably 15-40 degrees, more preferably 25-30 degrees,
- and whereby the proportion by volume of the reinforcements of the aforementioned load-bearing part of the rope is at least 60 per cent by volume reinforcing fibers in the load-bearing part.

2.3 The opponent argued that two partial problems were solved thereby, but that the claimed solution was obvious for a person skilled in the art. In the opinion of the opponent, the first partial problem was to increase the tensile strength of the rope. The second partial problem was to adapt the rope of E1 such that it can cooperate with a pulley having V-shaped circumferential protrusions.

2.3.1 The Board agrees to the first partial problem and also accepts that by making use of a fibre content of 60% or more, a rope is achieved that has a high tensile strength. This is however known in the art. During the oral proceedings before the Board, the proprietor acknowledged that there were in fact no obstacles for a

skilled person to apply a fibre content falling within the claimed range in the rope of Figure 4 of E1.

As both the measure and the advantages thereof are considered well-known, the Board concludes that the skilled person, when putting the teaching of E1 into practice and wishing to increase the tensile strength of the rope, would use a fibre content of at least 60% by volume without the need to exercise an inventive step.

- 2.3.2 The further distinguishing features relating to the depth and shape of the groove are however not considered to be obvious to a skilled person. As argued by the proprietor, the shape of the grooves in form of the letter "V" adds some flexibility to the rope in a transverse direction. The V-shaped grooves of the contested patent are not needed to guide the rope. This guiding function can be accomplished by a cambered pulley in cooperation with a rope that can conform to the cambered pulley through the V-shaped grooves providing flexibility in the rope's transverse direction.

Starting from E1, the skilled person does not get an incentive from any prior art in the proceedings to amend the U-shaped grooves of the Figure 4 embodiment of E1. On the contrary, in the context of a groove provided as a guiding means, a skilled person would refrain from substituting the U-shape, which smoothens the stress distribution inside the rope, with a V-shape which inevitably leads to peaks of stress at the tip of the V. A skilled person would thus not adapt the rope of E1 such that it can cooperate with a pulley having a V-shaped circumferential protrusion.

In order to arrive at the claimed invention, a skilled person would need to amend the entire guiding concept from the U-shaped grooves cooperating with corresponding circumferential protrusions on the pulley to a system without such protrusions but comprising other means to guide the belt. Also for this there is no incentive apparent from the prior art on file. This finding is not altered by E4 either, as it is undisputed that V-shaped grooves and their dimensioning are as such known in the art. The skilled person not only had no incentive to apply them in E1, but still further had good reasons not to do so.

- 2.4 The opponent also presented an inventive step attack starting from E2. Whilst E2 does disclose V-shaped grooves, these are not provided in the load-bearing part of the rope, which is furthermore not of rectangular shape. No incentive is apparent to amend the entire design of the rope of E2 and apply V-shaped grooves in the load-bearing parts so amended.

Starting from E2, a skilled person would thus not arrive at the subject-matter of claim 1 without an inventive step being involved.

- 2.5 Therefore, the subject-matter of claim 1 involves an inventive step (Article 56 EPC). With claim 11 defining the corresponding method for manufacturing the product of claim 1, the Board comes to the same conclusion in view of claim 11.

3. Auxiliary request IV is thus allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in the following version:
 - Claims 1 to 16 of auxiliary request IV as filed during the oral proceedings before the Board.
 - Description
 - pages 2 and 6 as filed during the oral proceedings before the Board,
 - page 3 as filed during the oral proceedings before the opposition division,
 - pages 4, 5, 7, 8 and 9 of the patent specification.
 - Figures 1 to 3 of the patent specification.

The Registrar:

The Chairman:



D. Grundner

M. Hannam

Decision electronically authenticated