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Datasheet for the decision of 9 January 2015

Case Number: T 0610/13 - 3.2.03

Application Number: 06704540.1

Publication Number: 1838929

IPC: E04B1/344

Language of the proceedings: EN

Title of invention:
Pyramidal flexible element

Applicant:
Close Joint-Stock Company "GST"

Headword:

Relevant legal provisions:
EPC Art. 84, 52(2)(a)

Keyword:
Claim - clarity (no)
Patentable invention - (no)

Decisions cited:

Catchword:

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Case Number: T 0610/13 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 9 January 2015

Appellant: (Applicant)	Close Joint-Stock Company "GST" Pr-t Lenina, 56 Kharkov, 61072 (UA)
Representative:	Stenger, Watzke & Ring Intellectual Property Am Seestern 8 40547 Düsseldorf (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 23 October 2012 refusing European patent application No. 06704540.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Ashley
Members:	V. Bouyssy
	M. Blasi

Summary of Facts and Submissions

I. European patent application No. 06 704 540.1 (in the following: "the application") relates to model flexors, that is deformable closed polyhedral shells having the form of star-like bipyramids. It was filed as an International application PCT/UA2006/000002 and published as WO 2006/078227 A1.

II. The Examining Division refused the application for lack of clarity of the claim (Article 97(2) EPC).

III. This decision has been appealed by the applicant (here appellant).

IV. The appellant requested that the appealed decision be set aside and a patent be granted on the basis of the claim as published.

V. The sole claim is directed to the following subject-matter:

"A model elementary flexor in a form of four-angle star-like pyramid formed by thin elastic three-angle faces with hinge junctions, having two symmetry planes which intersect the petals of flexor, wherein each face in the projection of the middle polyhedron into the plane of the boundary is mapped to a triangle whose doubled intrinsic and extrinsic angles adjacent to the boundary are equal to $\pi/2 - \alpha$ and $\pi/2 + \alpha$ respectively, where α is the third angle of the triangle, characterized in that, for providing a non-rigid, either soft or slow, loss of stability, the flexor admits well-defined continuous free deformations inside the class of polyhedral models with plane sliding of the boundary and with large cross-deflection, each of

said angles α and said third angles is laid within the interval of (0, π/2) and the linear sizes and the lift amplitude are independent space parameters."

VI. The following prior art documents are among others cited in the application:

D1: UA54692 C2

D3: Milka A. D., "Linear bending of star-like pyramids", Comptes Rendus Mécanique 331, 2003, pages 805 to 810

VII. The reasoning of the Examining Division with respect to the alleged lack of clarity of the claim can be summarised as follows:

In the claim, the terms "the middle polyhedron", "the boundary", "the linear sizes", "the lift amplitude" and "the class of polyhedral models" lack antecedents. It is also not clear what is meant by these terms in the light of the description and figures, nor do they have a well-recognized meaning in the field of mechanical or civil engineering.

It is not clear what is meant by the terms "intrinsic and extrinsic angles" and "third angle".

The embodiment of the invention as shown in Figure 2 is not in conformity with the term "four-angle star-like pyramid" in the claim.

VIII. The argumentation of the appellant can be summarised as follows:

The terms "the middle polyhedron", "the boundary", "the class of polyhedral models", "the linear sizes" and

"the lift amplitude" as used in the claim are commonly used in the mathematical theory of deformations of thin shells, and thus have well-recognized meanings in the relevant field.

The terms "intrinsic and extrinsic angles" and "third angle" refer to clearly defined angles of a triangle in Euclidean geometry.

The flexor in Figure 2 has been constructed according to prior art as cited in the description.

IX. With the summons to oral proceedings, the Board sent a communication pursuant to Articles 15(1) and 17(2) of the Rules of Procedure of the Boards of Appeal (RPBA) indicating to the appellant its preliminary, non-binding opinion of the case. In the communication, the Board raised a patentability objection under Article 52(2)(a) EPC for the first time.

X. In a response dated 17 November 2014 to the summons, the appellant informed the Board that it neither intended to attend the oral proceedings nor to file any further submissions. In addition, the appellant requested to continue the proceedings by forwarding a written decision.

XI. However, in a further submission dated 3 December 2014, the appellant argued that the claimed subject-matter is clear, novel, industrially applicable and patentable; an amended claim was attached as "Annex B" to the submission. The authorised representative nevertheless confirmed by telephone (4 December 2014) that he would not be attending the oral proceedings. The oral proceedings were therefore cancelled.

Reasons for the Decision

1. Claim on file

1.1 In the examination proceedings, the applicant requested that a patent be granted on the basis of the claim as published. The Examining Division understood this request in the sense that the claim on file was that as originally filed and published in WO 2006/078227 A1. This clearly follows from points 6 and 7 of the appealed decision.

In the statement setting out the grounds of appeal, the appellant requested, *inter alia*, that a patent be granted on the basis of the claim as published and has consistently referred to the wording of the claim as originally filed and published (see section 2 thereof).

The Board therefore has the same understanding of the appellant's request as the Examining Division.

1.2 Under the section "The Claim" of its submission dated 3 December 2014, the appellant mentioned for the first time corrections of the claim under Rule 26 PCT and referred to the amended claim in Annex B of the submission. The Board, however, is not aware of a request for correction of the claim under Rule 26 PCT. In fact, what can be gleaned from the file is that the applicant filed a request for rectification of obvious errors under Rule 91 PCT, which was refused by the European Patent Office as the International Searching Authority (see point 2 of the communication dated 18 October 2007), and that the applicant later filed an amended claim under Article 19 PCT with the International Bureau. It is apparent, however, that the wording of this amended claim filed under Article 19

PCT differs from that of the amended claim in Annex B. In conclusion, this part of the appellant's submission is contradictory. Even though the corrections mentioned under section "The Claim" and/or the amended claim of Annex B might have been meant to form the basis of a new appellant's request, the appellant's intention is very unclear, in particular whether the new claim forms the basis of a new main request or is to be considered as an auxiliary request. In response to the telephone call of the Board on 4 December 2014, the appellant's representative was not in a position to clarify this issue.

1.3 It is not for the Board to investigate or speculate on which basis the grant of a patent is requested. Instead, it is duty of the appellant or of its authorised representative to formulate its requests so that they can be understood by the Board. In the present circumstances, the Board must assume that the claim on file still is the claim as originally filed and published, in conformity with the consistent appellant's request throughout the examination and appeal proceedings.

2. Article 84 EPC

2.1 Since the purpose of Article 84 EPC is to ensure legal certainty as to the actual scope of protection conferred by the claim, the meaning of the features recited in the claim should be clear for a person skilled in the art from the wording of the claim alone.

2.2 The claim has been written by, and for, a person skilled in the mathematical theory of deformation of thin shells, having general knowledge in the mathematical fields of discrete geometry and rigidity

theory. In these fields, a flexible polyhedron is a polyhedron constructed with rigid plates for faces, which are connected by hinges along their edges that allow the polyhedron to be continuously deformed or bent while all the faces remain rigid, i.e. undeformed. It follows from the Cauchy rigidity theorem of 1813 that, in three-dimensional space, such a polyhedron cannot be convex. In the late 1970s, the term "flexor" was introduced by R. Connelly to refer to non-convex, non-self intersecting flexible polyhedra. The expression "model flexor" was recently introduced to refer to another family of non-convex polyhedra: polyhedral shells in the form of star-like bipyramids, i.e. closed polyhedral shells formed by two star-like pyramids symmetrically placed base-to-base, which are rigid in the sense of Cauchy but freely deformable without visible distortions of material (in the application as published, see page 2, second and last paragraph; in the prior art see D1 and D3, page 806, paragraph 1 and page 807, paragraph 2).

2.3 The Board thus agrees with the appellant that, assisted by his common general knowledge, the skilled reader of the claim would immediately recognise the intended meaning of each of the expressions "middle polyhedron", "boundary", "intrinsic and extrinsic angles", "third angle" and "linear sizes" in the context of the claim.

2.4 However, as argued by the Examining Division, the expression "the lift amplitude" in the claim is unclear and the Board cannot find, and the appellant has not provided, any evidence that this expression has a generally accepted meaning in the art. In its latest submission dated 3 December 2014, the appellant asserted that the "lift amplitude" is the height of the

claimed pyramid but no evidence has been provided in support of this assertion.

2.5 Further, the claim requires that "the flexor admits well-defined continuous free deformations inside the class of polyhedral models with plane sliding of the boundary and with large cross-deflection". This functional feature seeks to define the invention by a result to be achieved, without it being clear from the claim itself exactly which technical features enable "well-defined continuous free deformations inside the class of polyhedral models". In practice, in the embodiment disclosed in the description (page 8), the deformation or cross-deflection of the flexor depends on the method of determination and the conditions of measurements. Thus, the claimed feature does not allow the skilled person to directly and reliably verify which subject-matter is actually covered by the claim.

2.6 In Annex A to its submission dated 3 December 2014, the appellant argued that the latter feature means that the flexor "allows, under small loads, large and reversible deformations without visual distortions of the material". Even if this feature was construed in this manner, it would still not provide a clear and unambiguous definition of the claimed subject-matter, in particular because the terms "small" and "large" are relative terms having no well-recognised meaning in the art.

2.7 Finally, the Board considers that the expression "model elementary flexor" in the claim also lacks clarity. As explained in point 2.2 above, the terms "flexor" and "model flexor" have well-recognised meanings in the art. However, this does not appear to be true for the expression "model elementary flexor", as used in the

claim. In particular, this expression cannot simply qualify a "model flexor". Indeed, as indicated above, a "model flexor" is normally understood to be a bipyramid, while the claimed "model elementary flexor" is in the form of a single pyramid.

2.8 In conclusion, the Board shares the view of the Examining Division that the claim does not meet the clarity requirement of Article 84 EPC.

3. Article 52(2)(a) EPC

3.1 The claimed subject-matter is a purely abstract geometric object, waiting for a concrete technical application. Thus it is excluded from patentability under Article 52(2)(a) EPC.

3.2 In Annex A of the submission dated 3 December 2014, the appellant contended that the claim "deals with a technical image of a star-like pyramid projected into a plane". This confirms the Board's view that the claimed subject-matter is a geometric object. In contrast to this, however, a claimed "invention" within the meaning of Article 52(1) EPC must be of a technical character, rather than being a mathematical concept.

3.3 In the submission dated 3 December 2014, the appellant also asserted that the claimed subject-matter is patentable and that patents have been granted in a number of countries. These assertions, however, do not constitute any relevant counterargument to the above objection under Article 52(2)(a) EPC.

4. Oral Proceedings

4.1 The above objections under Articles 84 and 52(2)(a) EPC have all already been raised in the Board's communication pursuant to Articles 15(1) and 17(2) RPBA accompanying the summons to oral proceedings.

4.2 In response the appellant informed the Board that it did not intend to attend the oral proceedings. In addition, the appellant requested to continue the proceedings by forwarding a written decision, and the appellant reacted to the above objections by way of its submission dated 3 December 2014.

4.3 Under these circumstances, the Board is in a position to give a decision without holding oral proceedings.

5. In conclusion, the application must be refused under Article 97(2) EPC in conjunction with Articles 84 and 52(2)(a) EPC.

6. As an *obiter dictum*, the Board considers that, even if the claim was amended according to Annex B of the submission dated 3 December 2014, it could not overcome all the above objections under Articles 84 and 52(2)(a) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

C. Spira G. Ashley

Decision electronically authenticated