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**Datasheet for the decision
of 19 February 2026**

Case Number: T 0632/23 - 3.2.02

Application Number: 17760965.8

Publication Number: 3422887

IPC: A42B3/12, A42B3/06

Language of the proceedings: EN

Title of invention:

HELMET WITH A PROTECTIVE LINER

Patent Proprietor:

WaveCel, LLC

Opponent:

Studio Torta S.p.A.

Headword:

Relevant legal provisions:

EPC Art. 100(a), 54, 56, 100(b), 100(c)
RPBA 2020 Art. 12(4), 12(6), 13(1)

Keyword:

Grounds for opposition - extension of subject-matter (no) -
insufficiency of disclosure (no) - lack of patentability (no)
Novelty - (yes)
Inventive step - (yes)
Amendment to case - amendment admitted (no)

Decisions cited:

G 0001/24, T 2350/16

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

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Case Number: T 0632/23 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 19 February 2026

Appellant: Studio Torta S.p.A.
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 18 January 2023 rejecting the opposition filed against European patent No. 3422887 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman M. Alvazzi Delfrate
Members: T. Rosenblatt
W. Ungler

Summary of Facts and Submissions

- I. The appellant (opponent) filed an appeal against the decision of the opposition division rejecting the opposition against European patent No. 3 422 887.
- II. The parties were summoned to oral proceedings before the Board of Appeal. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the parties were informed of the Board's provisional opinion. The content of that communication will also be referred to in the following as the "provisional opinion" of the Board.
- III. Oral proceedings before the Board were held on 19 February 2026.
- IV. The appellant requested that the decision under appeal be set aside and the patent be revoked.
- V. The respondent (patent proprietor) requested that the appeal be dismissed, or that the patent be maintained according to one of auxiliary requests 1 to 3 submitted with the reply to the statement of grounds of appeal.
- VI. Independent claim 1 of the opposed patent reads as follows (bold feature designation in square brackets added, according to point 13 of the impugned decision).

"**[A]** A protective helmet, comprising:

[B] an anisotropic cellular liner (101) with a compressive stiffness that is lower in-plane than out-of-plane;

[C] an adjacent liner (102) made of rigid foam ;

[D] wherein the anisotropic liner (101) is at least

partially recessed and confined in the rigid foam liner (102) to prevent global translation of the anisotropic liner (101) relative to the rigid foam liner (102); and

[E] characterized in that a barrier layer (103) is provided between said anisotropic liner (101) and adjacent foam liner (102) so that the anisotropic cellular liner (101) floats relative to the adjacent foam liner (101) and can translate relative thereto."

VII. The parties referred to the following documents.

D1 : US 2015/0047110 A

E1 : US 2004/0117896 A

E2 : DE 29917109 and an English machine translation thereof

E3 : US 2014/0013492 A

E4 : US 2012/0060251 A

E5 : WO 2014/171889 A

VIII. The arguments of the appellant can be summarised as follows.

Articles 100(a) and 54 EPC

Granted Claim 1 lacked novelty over E1 and E2.

The opposition division was wrong to consider features B, C and D of claim 1 to lack disclosure in E1. The case law on selections of features from different long lists, as frequently applied in chemistry, would not apply to the present case in the field of mechanics (see, for example, T 2350/16). Notably the very short and single list of materials disclosed in paragraph 50 of E1 for the energy absorbing layers resulted in a selection from among two or three elements, two of

which being foams, thus essentially four possible combinations of materials. The skilled person thus would have arrived at the combination of materials according to features B and C of claim 1. In regard to feature D of claim 1 of the patent in suit, neither the wording of the claim nor any other part of the patent defined what should be understood by "global translation"; claim 1 did not require a recess to be present. Feature D was disclosed in E1 since the inner layer (41) was recessed and confined by the inner contour of the helmet's outer layer (43) which thus prevented at least one global translation, namely in the radial direction.

The helmet disclosed in the figure of E2 comprised a honeycomb 3 that floated and could translate with respect to the foam liner 1. The term "float" in feature E meant to rest or to stay on the surface without sinking or moving across a surface. This was realised by the plate 4 according to E2. Since the honeycomb thus remained on the surface of the foam liner and was otherwise held in the recess of the foam liner by a form fit or friction fit in the same manner as in the patent in suit, it consequently could also freely move across the plate. Claim 1 did not specify any condition under which the cellular liner should float or translate, whereas according to the description this was subject to an oblique impact. At least under such impact condition the same would happen in E2. The expression "can translate" merely specified a potential for translation. A skilled person would thus have understood that forces existed in nature which made the honeycomb to translate. Moreover, also an out-of-plane deformation of the honeycomb occurring due to an impact corresponded to a (radially inward) translation of the honeycomb relative to the foam liner

recess. Moreover, if the honeycomb used in D1 could perform partial relative movement, as recognised by the Board in its provisional opinion, there was no reason why the honeycomb of E2 could not translate.

Articles 100(a) and 56 EPC

Claim lacked inventive step in view of the combination of either of D1 or E2 as a starting point with any of E1, E3, E4 or E5, respectively.

The single distinguishing feature of claim 1 over the helmet known from D1 was only feature E. The honeycomb insert was arranged in D1 in the same way as in the patent and it functioned also in the same way. D1 only missed a barrier layer provided between the cellular and the foam liner so that the cellular liner floats and translates relative to the foam liner. E1, E3, E4, E5 were sufficient to explain that a layer arranged between outer and inner layers of a helmet facilitates their relative sliding regardless the fact that the outer and inner layers have complementary shapes like in document D1. In particular, the corresponding layers were hinted at by

- the several types of interface layers 45, 84, 138 disclosed in figures 6/7, 8B or 13 of E1, respectively, for which the skilled person, using trial and error or normal design procedures, had no difficulty to adapt notably their dimensions to the dimension of the recess of D1, taking thereby also into account that ventilation apertures would have to be maintained, as for example suggested by paragraph 46; the interface layer of E1 allowed to mitigate the effects of oblique impacts, as was apparent for example from its abstract;
- the interface layer 606 (or 607) according to

paragraph 34 and figure 6 of E3, arranged for facilitating sliding between an intermediate layer (602), in form of a cellular liner, and an inner layer (605) comprising a recess like that of D1; as was further apparent from *inter alia* figure 7 and paragraph 35, E3 also disclosed discrete fixation points that were exactly equal to the abutting points implemented by the sidewalls of the recesses as described in paragraph 32 of the opposed patent; the cellular layer 707 shown in figure 7 was recessed and confined in the inner layer 705 and a low friction layer according to figure 6 and paragraph 34 was arranged between them; as was apparent from claim 6 and lines 1 to 5 of column 4, a (single) glidable interface layer could be provided in all embodiments between the intermediate cellular layer and the respective inner or outer layers; the skilled person was thus not required to discard and select any element when combining D1 with E3; the presence of air vents in the helmet of D1 did not contradict this combination since this aspect was also taken into account in paragraph 25 of E3;

- the intermediate layer 10 known from the helmet of, for example, figure 18 of E4 and provided at a sliding surface of the helmet, which according to paragraph 7 and 64 of E4 could be an ellipsoid or could correspond in shape to the inner and outer faces of the helmet's inserts, allowed for relative movement between the helmet's inserts; the objective was referred to in E4 and the interface layer only required its dimension to be adapted to that of the recess in the helmet according to D1, taking thereby also into account that ventilation apertures could be maintained;

- the sliding facilitator disclosed in E5, which sliding facilitator enabled a sliding movement between a first and a second part of a helmet in response to rotational force created by an oblique impact, as described in paragraph 38 of E5; like in the patent and according to paragraph 17 of E5, the sliding facilitator could be constituted as a layer or coating attached to a foam liner of D1 in order to reduce friction and improve sliding.

Moreover, E1 as well as E3 and the opposed patent had common inventors, so that the inventor of the present patent was well aware of the possibilities of facilitating relative sliding of layers in a helmet. As was further apparent from paragraph 3 of E5, helmet constructions using sliding surfaces for reducing angular acceleration of the head due to an impact were already known; it was known that such sliding movement could be improved by the interface layers disclosed in the documents referred to.

Moreover, the subject-matter of claim 1 was also obvious over a helmet known from D1 when common general knowledge was taken into account.

In the alternative to the objection based on the combination of D1 with E3, the helmet according to claim 1 was actually distinguished over the helmet known from E3 only by the material of the inner layer, which was not disclosed as being made of foam. Therefore claim 1 also lacked inventive step starting from E3 and combining with D1.

E2 constituted an even closer or more promising starting point than D1 for the assessment of inventive step. The plate between the honeycomb and the foam

liner of the helmet according to E2 constituted a barrier layer according to feature E and required only to allow floating and relative translation of the honeycomb relative to the foam liner. A skilled person, in view of the problem of mitigating the effects of tangential forces, would have looked to one among documents E1, E3, E4 and E5, because all of them referred to this problem. In view of the technical problem, the skilled person would have substituted the plate of the helmet according to E2 with either of

- the interface layer of document E1, interposing it between the honeycomb and the foam liner of the helmet according to E2 and securing it to them, as suggested in paragraphs 26 of E1;
- one glidable layer 606 of document E3, adding it between at least a part of the honeycomb and the foam liner of the helmet according to E2, as suggested claim 6 of E3;
- the intermediate layer, also known as sliding surface, in one of the several versions proposed for the helmet according to E4, see for example paragraph 14;
- the sliding facilitator disclosed in E5, e.g. by using a layer or a material embedded in or attached to one or both of the surfaces of the outer and/or inner layers as suggested in paragraphs 16 and 17.

Article 100(b) EPC

The opposition division had considered that a cellular liner according to claim 2 of the patent in suit required a liner having an open cell structure and a liner made of an auxetic material. This interpretation of claim 2 was not disclosed in the patent. Accordingly, claim 2 was not disclosed in a manner sufficiently clear and complete for allowing the

skilled person to carry it out. Moreover, the respondent argued in the context of novelty of claim 1 over E2 that a particular relative rigidity of the cellular liner and of the adjacent foam liner was essential. However, this had not been mentioned anywhere in the opposed patent, so that the invention was insufficiently disclosed.

Article 100(c) EPC

The characterising portion of claim 1 of the opposed patent had been amended based on paragraph 22 of the application as filed. This paragraph related to a "polymer shell" instead of a "foam liner". Since the term "shell" and "liner" were not synonymous, the first referring to an outermost part of the helmet, the second to a layer arranged inside another layer, the replacement of "polymer shell" with "foam liner" was not supported by the application as filed and represented an extension of the subject-matter beyond the content of the original application.

IX. The arguments of the respondent can be summarised as follows.

Articles 100(a) and 54 EPC

E1 failed to disclose *inter alia* the combination of features B and C of claim 1, since there was no direct and unambiguous disclosure of a helmet which definitely had both a honeycomb cellular liner and a rigid foam outer liner, as both of these features were only optional among a number of other possibilities within the two lists disclosed in paragraph 50. The selection of two materials from one list was equivalent to a twofold selection from two identical lists (see also T

811/96).

E2 failed to disclose feature E. For a mechanical engineer, the term "floats" implied an ability to move. This understanding was also supported by the description of the patent, see notably paragraphs 15, 24 and 30, which all implied a degree of permitted relative movement. The expression "can translate ... thereto" referred to the movement in the recess, as could be clearly derived from the patent as a whole. A plate that prevented penetration of the honeycomb into the foam liner in the embodiment of a helmet shown in the figure of E2, did not necessarily mean that it allowed the honeycomb to float and translate relative to the foam liner. The plate was clearly shown to be contiguous or bonded with the honeycomb insert and separated from the inner dome by a gap. The bonding of plate and honeycomb was further supported by the description of E2. Such bonding would prevent translation between the two components. Nothing about the plate indicated that the honeycomb could translate with respect to it, or that it could translate with respect to the inner dome. There was no indication in E2 that the honeycomb structure was elastic; a friction fit could also be realised if the recess walls are deformable.

Articles 100(a) and 56 EPC

The combination of the helmet known from D1 with any of the documents E1, E3, E4 or E5 does not lead in an obvious way to the combination of features of claim 1. D1 did not disclose any detail of the function of the honeycomb insert other than its general purpose of impact absorption and ventilation, see paragraph 12. The exact mechanism of energy absorption by the

honeycomb insert was not disclosed. The honeycomb could just be brittle so as to be crushed under an impact. There was no evidence in D1 that the honeycomb insert could slide in the recess, the potential small movement implied by paragraph 16 of D1 would not be understood as mitigating the effects of an oblique impact. Such consideration relied on hindsight. The distinguishing feature E of claim 1 over the helmet of D1 thus solved the objective technical problem of mitigating the effects of an oblique impact. The technical problem was therefore not to facilitate sliding of the honeycomb insert in the recess of the foam liner, so that the skilled person had no motivation to look only at something to facilitate sliding.

The helmets known from E1, E3, E4 and E5 were all based on the concept of a spherical or ball-and-socket-type bearing mechanism. Combining the respective teachings of any of E1, E3, E4, E5 with D1 would result in helmets different to the claimed helmet. This required free outer edges of the relatively movable inner and outer helmet layers.

The interface layer according to E1 was functionally linked to the inner and outer helmet layers and could not be isolated from these, all three layers together provided for the resulting ball-and-socket type bearing. Combining the teachings of D1 and E1 would have meant to get rid of the recess in the configuration of D1, therefore arriving at something different than the subject-matter of claim 1.

Also the helmet configuration of E3 is based on a multi-layer arrangement by which a spherical bearing is realised in order to solve the problem of mitigating the effects of an oblique impact, see notably paragraph

26. The glidable interface layers used in the embodiment of figure 6, are optional and only serve as an enhancement, without themselves representing the solution. The stops employed in the embodiment of figure 6 would not amount to a recess according to D1.

The helmet according to E4 similarly disclosed a spherical bearing assembly in which an intermediate layer was only optionally added, see paragraphs 6, 53 and 55. Paragraph 14 disclosed the function of the intermediate layer and was moot with respect to its signification in view of oblique impacts.

The sliding facilitator disclosed in E5 constituted again an optional feature, see paragraphs 16 and 17.

Even if several documents disclosed interface layers to improve sliding between adjacent helmet components, it could not be considered as common general knowledge that such layers were provided as solutions to the objective problem.

The objection based on a combination of D1 with common general knowledge had not been submitted before the opposition division.

The objections based on E2 in combination with E1, E3, E4 or E5 cannot lead to a different conclusion as when starting from D1.

Article 100(b) EPC

The person skilled knew exactly what was meant by an open cell structure, and that auxetic properties must be provided by using an auxetic material for the liner, and that the use of an open cell structure together

with an auxetic material enabled the desired spherical deformation of the liner without irregular distortion of the cell geometry. Thus, the skilled person was able to carry out the invention.

Article 100(c) EPC

The appellant's objection was merely directed to consistency of terminology, thus clarity under Article 84 EPC, which was not a ground for opposition. Moreover, the term "rigid foam" appeared already in original claim 1. There was thus no issue of any added matter.

Reasons for the Decision

Background of the invention

Claim 1 of the patent in suit is directed to a protective helmet for protecting the head of the wearer against skull fracture and brain injury caused by an impact with an object. Typically, an object will not hit the helmet in a direction strictly normal to its surface, i.e. in a radial direction with respect to the centre of the head, but under an oblique angle. The impact will generate a force having a directional component acting tangentially to the helmet's curved surface. This will result in a rotating movement of the helmet around its centre point located somewhere in the head of the wearer. The resulting rotational acceleration can be transmitted to the head which may lead to trauma of the above mentioned types. According to the description of the patent, the structure of the helmet is intended in particular to mitigate rotational acceleration of the head caused by oblique impact of an

object.

Interpretation of claim 1

1. The assessment of novelty (and inventive step) of claim 1 requires the Board to set out how the skilled person would understand certain features of claim 1 of the patent in suit which are of particular relevance for the decision to be taken. According to decision G 1/24 of the Enlarged Board of Appeal the description and the figures of the patent are to be consulted for the purpose of claim interpretation (G 1/24, order).
- 1.1 Claim 1 cites *inter alia* an anisotropic cellular liner, which is referred to in the patent description and the claims also briefly as anisotropic liner or cellular liner. The claim further defines an adjacent liner made of rigid foam, also referred to as rigid foam liner or as adjacent foam liner. With respect to this foam liner, the description of the patent uses alternatively also the term "shell" (see for example paragraphs 13 and 15). Figures 2A, 2B, 3, 4 and 5 show embodiments of a helmet in which the anisotropic liner can be essentially co-extensive with a recess of the rigid foam liner or shell. Both liners, like the intermediate barrier layer between them, would be understood by the skilled person to constitute layers of the helmet. From the entire content of the patent the skilled person would understand that the structural features implied by the term "liner" used in claim 1 in relation to the two distinct structural components defined by features B and C cannot be distinguished from features implied by the terms "shell" or even "layer".
- 1.2 Feature D requires the anisotropic (cellular) liner to be at least partially recessed and confined in the

rigid foam liner to prevent global translation of the anisotropic (cellular) liner relative to the rigid foam liner (emphasis added by the Board). The underlined expression appears to contradict the requirement set out in feature E according to which the anisotropic (cellular) liner floats and can translate relative to the rigid foam liner. Moreover, the meaning of "floats" was subject of diverging views between the parties.

- 1.2.1 From the description and the figures of the patent the skilled person understands that the anisotropic liner's recessed and confined arrangement within the rigid foam liner according to feature D covers an essentially snug-fit arrangement of an insert made of an anisotropic cellular material filling a correspondingly shaped recess in the rigid foam liner. The recess in the rigid foam liner is constituted by side walls and a bottom surface, providing a geometrical constraint for at least part of the insert's periphery (see for example column 4, lines 26 to 35, column 5, lines 35 to 39, figures 1 to 5). Feature D is thus intended to imply that the anisotropic (cellular) liner is hindered from translations at least along directions parallel to the extension of its curved contour and going beyond the limits imposed by structural or constraining features (side walls of a recess) of the rigid foam layer providing for the "recessed and confined" arrangement. Whether the expression "global translation" could be understood by the skilled person to refer to movements by which the anisotropic would be moved normal to its (curved) extension, thus (radially) outward of the recessed and confined arrangement in the rigid foam layer, as it was held by the appellant notably in its novelty attack based on E1, does not require further consideration for the purpose of this

decision (see also point 3.3 below).

- 1.2.2 The seemingly contradicting requirement according to feature E, according to which the anisotropic cellular "can translate" relative to the rigid foam liner, will be understood by the skilled person according to the description and figures to refer to a translational movement of portions of the anisotropic cellular liner along its in-plane extension relative to the rigid foam liner due to, for example, an impact. As mentioned above, an impact may result in a force applied to the anisotropic liner with a force component acting along the tangential or its in-plane direction. This would lead to an in-plane compression of the cells of that portion of the anisotropic cellular liner which is situated ahead of the impact zone, in the direction of the tangential force component. Trailing portions of the anisotropic cellular liner which are situated, seen from the zone of impact, in the opposite direction remain essentially uncompressed. Since both portions are linked by cells which essentially remain intact (not being torn apart), the unaffected trailing portion of the anisotropic liner is drawn by the compression of the other portion and translates in the direction of the tangential force component relative to the rigid foam liner (see for example column 4, lines 20 to 23, paragraph 26, figure 1A, 1B, 2A, 2B). Although the anisotropic cellular liner is prevented from generally translating out of its recessed and confined arrangement by a force acting in the in-plane direction (feature D), it can however translate (feature E), at least partially, due to its compression within the limits of its recessed and confined arrangement.
- 1.2.3 The barrier layer according to feature E is specified to be provided between the anisotropic liner and the

foam liner "so that the anisotropic cellular liner floats relative to the adjacent foam liner and can translate relative thereto". The expression "so that" implies that the arrangement of the barrier layer between the anisotropic and the foam liner shall notably allow "both" properties to be realised by the barrier layer, namely an ability of the anisotropic liner to float on, and, together with this, an ability to translate with respect to the adjacent foam liner (within the above described meaning, see point 1.2.2). Contrary to the appellant's view according to which the term "float" only means that the anisotropic liner stays at the surface without sinking into it, the Board considers that the skilled person's normal understanding in mechanical applications of the term "float" encompasses the further ability that the anisotropic liner can be displaced in a plane roughly parallel to that surface. It thus implies also the ability provided by the barrier layer that the anisotropic liner "can translate" relative to the adjacent foam liner. The ability defined by "can translate" in feature E is thus to a certain extent encompassed by the term "floats". This understanding is moreover supported by the description of the patent, see column 3, lines 49 to 55, column 5, lines 29 to 35, column 6, lines 36 to 39.

The Board can agree with the appellant that the conditions under which the anisotropic cellular liner translates relative to the rigid foam liner, are indeed not specified in the claim. The Board rejects however the argument that the feature "can translate" would be understood by the skilled person in the sense of only a potential of translation under some impact force which could exist in nature and which would result in such a translation. Such a potential of translation always

exists between two objects and cannot reasonably be meant here. The skilled person would rather have understood, notably by the expression "so that" as set out before, that the barrier layer had to ensure the functions defined in the following by feature E between a rigid foam liner and an anisotropic cellular liner, functions which are not necessarily present between such components since in the absence of a corresponding feature the cellular liner might penetrate the foam liner.

Articles 100(a) and 54 EPC

2. The Board agrees with the findings of the opposition division in the impugned decision that the opposition ground pursuant to Articles 100(a) and 54 EPC does not prejudice the maintenance of the patent. The subject-matter of claim 1 of the patent is novel over each of documents E1 and E2 (Article 54(1) and (2) EPC).
3. The Board agrees with the opposition division that E1 does not disclose a protective helmet comprising features B and C in combination.
- 3.1 The helmet shown in Figure 4a of E1 comprises *inter alia* an inner energy absorbing layer 41, an outer energy absorbing layer 43 and an interface layer 45 disposed between the inner and outer layers (see for example paragraph 25).

Paragraph 50 of E1 discloses :

"Helmet materials are widely selectable, depending on design. By way of example, energy-absorbing layers can be constructed of polystyrene foam, expanded polystyrene foam, hexagonal honeycomb structures, and the like. Some outer shell

materials are: titanium/titanium alloys; epoxies; fiberglass-epoxy composites; carbon-fiber-epoxy composites; polyethylene; polycarbonate; and fluoropolymers. Some potential interface layer materials are: silicon-based gels; hyper-elastic materials (e.g., rubber based on latex, silicon, or polyurethane); and sliding interface layer pairs of polyethylene, fluoropolymers, or polycarbonate. Those skilled in the art will recognize from the preceding disclosure the large number of potential combinations of these, as well as other materials not explicitly listed, that can be combined in an embodiment of the present invention."

The second sentence of this paragraph indicates materials which could be selected for the helmet's energy absorbing inner and outer layers. Although foams and hexagonal honeycombs are indicated in the cited paragraph, where the honeycomb material would be understood by the skilled person to correspond to an anisotropic material as referred to in feature B of claim 1 of the patent in suit, it is not stated for which layer (inner, outer) which material should be used. The final statement of this sentence, "*and the like*", additionally opens up space for other materials. There is consequently a great number of possible material combinations, including the same or very similar materials in both layers. A material combination as specified by features B and C of claim 1 of the patent in suit is consequently not directly and unambiguously derivable from paragraph 50 of E1.

- 3.2 The appellant considered that paragraph 50 disclosed a single, short list made up of three options, rather than two lists as considered by the opposition division and the respondent. Therefore, no inventive selection

had to be made from two lists. According to the appellant, decision T 2350/16 stated that the concept of selection from lists, frequently applied in the chemical field, would not apply to the mechanical field.

The Board is however not convinced by these arguments. Paragraph 50 discloses indeed a single list for energy-absorbing materials, from which a selection has to be made for two distinct layers. The selections involved are thus twofold, equivalent to two selections from identical lists. Moreover, even though two of the three explicitly named materials in the list are foams, there are more than only two or three options for each of the distinct layers (see "and the like", as mentioned above), and consequently even more than only four possible combinations of materials for the two layers in total as argued by the appellant during the oral procedure. From the rather general disclosure in paragraph 50 the specific selection of layer materials according to features B and C of claim 1 of the patent in suit cannot be derived. Decision T 2350/16, referred to by the appellant in this context, does not state that the concept of selection from lists, frequently applied in the chemical field, would not apply to the mechanical field but rather that the jurisprudence relating to the selection of (long) lists was not applicable to the specific case underlying said decision (T 2350/16 , point 7.2). Moreover, as already stated in the Board's provisional opinion, there is no provision in the EPC which would allow to apply different standards in different technical areas for the assessment of *inter alia* the requirements of novelty and inventive step. The appellant has not commented upon this opinion so that the Board cannot see any reason to change its conclusion on this

particular aspect.

3.3 As to the disclosure of feature D by the helmet of Figure 4a of E1, i.e. the question of whether the inner layer 41 could be considered to be confined and recessed in the outer layer 43, a decision on this aspect is not relevant for the outcome of the present case. This is so because the subject-matter of claim 1 of the patent in suit is in any case novel over E1 for the reasons set out in points 3.1 and 3.2, and because the appellant did not submit any objection under Article 56 EPC based on E1 as a starting point, so that the final determination of all potentially distinguishing features and their relevance for assessing whether the claimed feature combination would be obvious to the skilled person is not required.

4. The Board also confirms the findings of the opposition division according to which E2 does not disclose a protective helmet comprising feature E to the extent that the barrier layer is provided so that the anisotropic layer floats relative to the adjacent foam liner and can translate relative thereto (underlining added by the Board).

4.1 A specific embodiment of a helmet is shown in the single figure and described on page 4 of E2 (corresponding to paragraphs 22 to 25 of the English machine translation). This helmet comprises an inner cap made of energy-absorbing foam. The inner cap has two recesses on its outer contour. An insert made of a honeycomb structure is inserted into and filling one of the two recesses of the inner cap. The honeycomb insert is fixed in the recess. It is furthermore closed on its radially inward facing side by a plate which prevents the honeycomb structure from penetrating into the

material of the inner cap.

The inner cap made of foam can be identified with feature C and the honeycomb structure with feature B of claim 1 of the patent in suit, its arrangement in a recess of the inner cap corresponds to feature D. The plate closing the honeycomb structure and preventing its penetration into the foam material of the recessed inner cap represents a barrier layer within the meaning of the first part of feature E.

The way of holding the honeycomb insert in the recess of the inner cap of the helmet according to the specific embodiment is not disclosed. With respect to a second insert made of foam and received in a second recess of the inner cap of the specific embodiment, adhesive bonding or a friction fit of the insert in the recess is envisaged (see lines 15 to 16 on page 4 of the E2, or paragraph 24 of its English machine translation). The general part of the description discloses that the insert (without specifying which of the two types) can be foamed into the inner cap or laid into the recess and be held by a form fit or a friction fit or be adhesively bonded to it ("*...der Einsatz in die Innenkalotte eingeschäumt, eingelegt und in der Ausnehmung durch Form- oder Reibschluss gehalten oder in die Ausnehmung eingeklebt ist*", see page 3, lines 27 to 29, corresponding to paragraph 21 of the English machine translation; see also claims 4 and 5 of E2).

Neither the part of the description relating to the specific embodiment of the helmet nor the general part of the description on page 3, lines 5 to 29 (corresponding to paragraphs 16 to 21 of the English machine translation), discloses any further detail of the honeycomb structure, its material or other

properties, like elasticity. Similarly, no details with respect to the material of the plate are disclosed. The plate is not even mentioned in the general part of the description where only a reinforcement of the recess for the purpose of preventing the penetration of the honeycomb structure is mentioned (page 3, lines 20 to 22), as noted by the respondent.

There is no information given in either part of the description in regard to a potential movability of either the plate or the honeycomb structure relative to the recessed surface of the inner cap, let alone of a movability of the honeycomb structure relative to the plate (barrier layer).

In the single schematic figure of E2, the honeycomb structure is drawn with lines attaching directly to the plate (4). The contiguous drawing of plate and honeycomb suggests that the plate is attached or bonded to the honeycomb structure, as pointed out by the respondent. This understanding is further supported by the description on page 4, lines 7 to 8, stating that the honeycomb structure is closed radially inward by a plate ("*die Wabenstruktur 3 nach radial innen durch eine Platte 4 abgeschlossen ist*", see also paragraph 23 of the English machine translation). The other side of the plate (4), facing the surface of the recess (2) in the inner cap (1), is shown detached, forming a small gap between the plate and the recess's surface. Small gaps between the upstanding walls of the recess and the combined structure of plate and honeycomb are shown. Similar gaps are present between the second insert and the walls/surfaces of the second recess. However, in view of the indications found in the description in regard to the fixation of the inserts in the recess (see above), the skilled person can only understand

from this drawing that the gaps are only there for better illustrating the separate components of the helmet, rather than for illustrating a potential movability.

4.2 Therefore, and despite the plate ensuring the honeycomb structure to remain or stay at the surface of the recess of the inner cap, which is however not synonymous to an anisotropic cellular liner that floats, as set out in point 1.2.3 above, it cannot be directly and unambiguously derived from E2 that the plate (barrier layer) provides for or facilitates translation of the honeycomb structure, or even only portions of it, relative to the inner cap.

4.3 The appellant submitted that the honeycomb structure had to have elasticity in order to be held by a friction fit as disclosed in E2, which would imply that the honeycomb would necessarily be able to translate. The appellant relied also on the similarity of certain terms and concepts between the helmet of E2 and of the patent in suit. The Board is not however convinced by these arguments.

A friction fit does not necessarily require the honeycomb structure to be elastic. The elasticity required for a friction fit could be provided by the material of the inner cap, as also argued by the respondent during the oral proceedings. It is also not disclosed that the honeycomb structure in the presence of the plate, as illustrated by the sole figure of E2, is indeed friction fit into the recess. As set out before, other ways of holding the inserts in the respective recesses are disclosed in E2 in the passages referred to by the appellant and the respondent, notably also adhesive bonding. Furthermore, and as also

already mentioned above, there is no hint in E2 pointing to an even only slightly elastic honeycomb structure, no material being mentioned.

The correspondence perceived by the appellant between a barrier layer provided as a coating according to the patent (see notably paragraph 25 of its description) and a "reinforcement" of the recess as mentioned in lines 20 to 22 on page 3 of E2 does not alter the Board's conclusion. Besides of the purpose of preventing penetration, a "reinforcement" does not disclose a coating, let alone a coating which would allow the honeycomb structure to translate with respect to the inner cap.

The fact that claim 1 does not exclude that the barrier layer could be adhesively adhered or bonded to the anisotropic cellular liner, as it may be the case between the plate and the honeycomb structure in E2, does by itself not mean that the disclosed combination of the plate and honeycomb structure must necessarily provide for the functions of floating and ability to translate according to feature E. This would depend on the strength of the plate against in-plane compression/deformation and on the strength of bonding of the honeycomb to it, nothing of which is disclosed in E2.

The appellant also argued that claim 1 of the patent in suit did not require the translation to be along the in-plane direction of the insert and encompassed also out-of-plane translation. The Board cannot find any indication in E2 that corresponding translations would be possible at all, let alone that the ability of performing said translation is the result of the provision of the plate constituting the barrier layer, as required by feature E (see point 1.2.3 above, "so

that..."). On the one hand, the plate according to E2 between the honeycomb structure and the inner cap shall prevent penetration, thus it would prevent radially inwardly directed "translation" rather than allowing it. The plate's function is also not to enable a radially inward directed, out-of-plane compression of the honeycomb structure within the inner cap's recess due to an impact, since the honeycomb structure would generally be compressed in the out-of-plane direction irrespective of the presence of the plate. On the other hand, and regarding the possibility of a radially outward directed translation, leading to a separation of the insert from the inner cap, the different manners disclosed in E2 to fix the insert to the inner cap seemingly serve to prevent the components to fall or be taken apart in use (see for example, page 4, lines 20 to 26, corresponding to paragraph 25 of the English machine translation). It is therefore not disclosed that any out-of-plane translation of the honeycomb structure could occur or could be intended in E2.

Finally, the Board notes that conclusions which may be drawn in regard to a partial movability of honeycomb inserts employed in other prior art helmets, such as in D1, do not mean that the same conclusions would apply to the honeycomb insert in E2. There is no indication in either of D1 or E2 that the honeycomb insert could be identical in all their relevant properties.

4.4 While the respondent argued in its reply to the appeal grounds that claim 1 of the patent in suit would be distinguished over the helmet of E2 by further features, the Board rejected these arguments, as stated in its provisional opinion (point 3.2). No further arguments have been submitted on this aspect of the Board's provisional opinion, so that the Board has no

reason to deviate from its opinion on this aspect which is hereby confirmed, leading to the conclusion that claim 1 is distinguished over the helmet known from E2 only by the part of feature E as indicated above.

Articles 100(a) and 56 EPC

5. The Board also confirms the findings of the opposition division that the opposition ground pursuant to Articles 100(a) and 56 EPC does not prejudice the maintenance of the patent.

The appellant validly raised objections starting from either D1 or E2 as a starting point, in combination with any of E1, E3, E4 or E5. Further objections based on D1 as a starting point in combination with common general knowledge and based on E3 as a starting point were not admitted into the appeal proceedings (see points 6.8 and 8. below).

6. D1 discloses a protective helmet (feature A of claim 1 of the patent in suit) comprising an outer shock-absorbing layer or liner (130) made of a foam according to feature C of claim 1. Honeycomb inserts (120, 122) corresponding to feature B are recessed and confined in the foam liner according to feature D.
 - 6.1 Compared to the helmet known from Figures 1 to 5 of D1 it was common ground between the parties that the subject-matter of claim 1 is distinguished over this prior art helmet only by a barrier layer according to feature E.
 - 6.2 According to paragraphs 12 and 18 of D1, the honeycomb material used for the inserts in D1 may be used to provide impact absorption. It has tubes that allow air

to freely flow to the head of the wearer, as pointed out by the respondent in writing and during the oral proceedings. As also argued by the respondent during the oral proceedings, the precise mechanism of energy absorption by the honeycomb inserts is not disclosed in D1. Even though the appellant contested the respondent's argument that the honeycomb material could be just brittle so as to be crushed during an impact, the Board cannot see any technical reason to exclude such a possibility. The Board agrees with the respondent that D1 is in particular silent as to any intention to mitigate effects of an oblique impact, let alone that this could be the result of an in-plane compression or a translation of (parts of) the honeycomb relative to the recessed foam liner.

- 6.3 As already stated in the Board's provisional opinion, the technical effect achieved by the distinguishing feature E is to allow a relative translation between (portions of) the honeycomb inserts and the shock-absorbing liner of D1 upon an oblique impact with an object.
- 6.4 As further indicated in the Board's provisional opinion, an objective technical problem might be seen in mitigating the effects (on the head) of oblique impacts. This was also the objective technical problem considered by the opposition division (see point 18.1.2) and by both parties.
- 6.5 Contrary to the appellant's view, neither of E1, E3, E4 or E5 comprises a hint which would have directed the skilled person, entrusted with the above objective technical problem, to the solution according to claim 1 of the opposed patent.

The objective technical problem is indeed dealt with in the documents referred to by the appellant (see for example E1, paragraph 2; E3, par. 2, 20; E4, par. 2, 6; E5, par. 2, 13, 14). However, the solutions provided are different and do not as such rely on the use of a barrier layer as defined by feature E of claim 1. The intermediate or interface layers disclosed in the prior art referred to by the appellant are rather components which assist or support the respective solutions, without however representing the solutions themselves.

As also argued by the respondent during the oral proceedings before the Board, the solutions proposed by the cited prior art essentially rely on a ball-and-socket-like bearing arrangement of at least two relatively rotatable inner and outer components of the respective helmet. These arrangements essentially allow an outer layer of the helmet to freely rotate over an inner layer worn on the head of the wearer, so that the outer layer may be thought of as constituting a "socket", whereas the inner layer on the wearer's head may be thought of as a "ball"; in the impugned decision, the term "spherical bearing" was used for this arrangement, which term is also used in, for example, E1. In the bearing arrangements according to the solutions presented in E1, E3, E4 and E5, the inner and outer layers may rotate with their respective edges beyond the edges of the respective other layer and are not limited by any wall like those of a recess according to D1.

Starting from the helmet known of D1, the skilled person would first have been required to recognise that a relative partial movement of the honeycomb insert in the recess due to its in-plane compression under the tangential force of an oblique impact would occur and

could itself be used as an energy-absorbing means. Only then could the skilled person have thought of how to provide or facilitate such partial movement of the honeycomb insert relative to the recessed foam layer. The first step is however not suggested in any of the documents so that the second step could only be seen to derive from knowledge of the invention.

The appellant's argument that the honeycomb inserts in D1 would be able to slightly translate and that the helmet of D1 provided already the technical effect of mitigating the effects of an oblique impact, which technical effect would be consequently improved, is not accepted. The Board rather follows the counter argument submitted by the respondent during the oral proceedings, according to which there is no indication in D1 that the honeycomb inserts could behave as implied by feature E when read by the skilled person, see points 1.2.2 and 1.2.3 above. Consequently the Board cannot see that there could be an improvement in the sense that the helmet of D1 already provided for some (slight) mitigating effect in case of an oblique impact which would only be enhanced by feature E.

6.6 The Board also notes in this regard that it is entirely irrelevant for its conclusion whether the specific contour of the relevant surfaces, i.e. in D1 the contour of the mutually facing/mating surfaces of the recess and the honeycomb insert, and in E1, E3, E4 and E5 the corresponding mating surfaces of the relatively movable helmet components, is spherical or non-spherical.

6.7 As stated before, the crucial point for the Board in reaching its conclusion is rather lying in the fact that the interface or intermediate layers described in

E1, E3, E4 and E5, by themselves are not solving the problem, but only the respective entire ball-and-socket-like bearing arrangement - where contrary to what happens in the recesses of D1, the movement of the inner layer is unconstrained - does so. Even the reoccurrence of the use of intermediate layers employed to reduce friction between two rotatably sliding helmet layers (E1, E3, E4 and E5) cannot be seen to indicate that such friction reducing interface layers constituted an almost commonly known solution to the problem of mitigating the effects of an oblique impact on the head of a wearer.

In particular:

- 6.7.1 E1 discloses a helmet with an inner energy-absorbing layer and an outer energy-absorbing layer. The interface layer disposed between and fixed (e.g. by adhesive bonding) to these two energy-absorbing layer provides, in essence, a *"spherical bearing with low/controlled friction to allow relative rotational displacement"* between the inner and outer layers under oblique impact conditions. In fact, the assembled helmet *"allows the inner helmet layer to remain essentially affixed to a wearer's head, while allowing potentially large rotational displacement of the helmet's outer layer(s)"* with respect to the inner layer (and the wearer's head) in response to an applied force (see paragraphs 25 to 27 of E1). Several embodiments are disclosed for the interface layers (for example figures 4A, 4B, 5 to 7 or 13) in which the inner layer may rotate freely with respect to the outer layer, without being hindered by any edges or borders formed on the inner or outer layer against which the respective outer or inner layer might abut. The total rotation is limited only by some "slack" section

provided in the interface layer (see for example paragraph 28). The skilled person would have understood from E1 that the function of the interface layer is linked to the inner and outer layers, as argued by the respondent during the oral proceedings. There is no indication which would have led the skilled person to isolate only the interface layer from this entire bearing arrangement. The application of the principles of E1 to a helmet of D1 would have meant to abandon the concept of the recessed and confined honeycomb inserts, i.e. to get rid of the recesses as argued by the respondent during the oral proceedings, and replacing them by the spherical or ball-and-socket-like bearing arrangement of E1.

Isolating the interface layer from the specific arrangement of E1 and inserting it into the recess, between the honeycomb insert and the outer shock absorbing foam liner of D1 could be arrived at only by hindsight. The appellant's consideration that the skilled person was "*looking for an interface (barrier) layer that allows a relative displacement (float & translate) of the cellular liner with respect to the foam liner for reducing rotation forces that create injury to brain*", as stated specifically in regard to the combination of D1 with E1 (for example, in the appeal grounds, page 9), is indeed illustrating the use of hindsight in its argument, since the skilled person is looking for a solution to the above stated objective technical problem, rather than looking "for an interface or barrier layer" which only constitutes an element of the solution of E1.

That the inventors of the patent in suit and of E1 are partly in common cannot alter the Board's conclusion.

6.7.2 Similar considerations apply to the combination of D1 with E3. The appellant notably relied on the embodiments of a protective helmet illustrated in figures 6 and 7, described in paragraphs 34 and 35, and additionally referred to paragraph 28 and dependent claim 6 of E3.

As stated before, E3 deals indeed with the problem of mitigating the transfer of a rotational acceleration, as it may result from an oblique impact, from a helmet's outer layer to its inner layer (see paragraphs 3, 20 and 26). The solution to this problem according to E3 is constituted by a suspension of a compressible intermediate layer between generally non-compressible inner and outer layers using a specific coupling of these layers through discrete, alternate fixation sites, as specifically described in, for example, paragraph 26 of E3, referred to by the respondent during the oral proceedings before the Board. Also in this embodiment the inner layer 105 may rotate freely with respect to the outer layer 104, in a ball-and-socket-like bearing arrangement. The Board accepts that glidable interface layers may indeed be added to any of the embodiments disclosed in E3, on either one or both sides of the compressible intermediate layer, as argued by the appellant when referring *inter alia* to dependent claim 6. However, from the description of the helmet embodiment of figure 6 in paragraph 35 and from dependent claim 6 the skilled person understands that the provision of one or more glidable interface layers between the intermediate (anisotropic cellular) layer and its adjacent inner and/or outer layer(s) constitutes indeed an optional enhancement or improvement of the general solution provided in E3 (see for example paragraph 34, "[i]n some embodiments, these interface layers [...] may reduce friction to enhance

tangential displacement between the inner and outer layers during an oblique impact"), as also argued by the respondent during the oral proceedings before the Board. The glidable interface layer itself therefore does not constitute the solution to the problem underlying E3 and to the above formulated objective technical problem. Like in the case of the appellant's arguments in view of the combination of D1 with E1, the skilled person does not look for a layer configured to facilitate sliding in order to solve the objective technical problem, as argued by the appellant on page 7 of its letter dated 17 October 2023. There is no such hint in E3, other than hindsight, from which it could be inferred that facilitating sliding between the anisotropic liner and the recessed foam liner in D1 would solve the problem. This finding is not altered by the similarity of the function of the alternate fixation sites according to the helmet embodiment of figure 7 or E3 with that of the walls of the recess according to D1.

- 6.7.3 The objections based on a combination of D1 with E4 or E5 are found unconvincing for similar reasons. Also in E4 and E5 the respective intermediate layer is disclosed as an optional feature to the configurations proposed in these documents to protect the wearer's head from rotational acceleration due to an oblique impact. The actual solution proposed in E4 is again a spherical or ball-and-socket like arrangement (see for example paragraphs 6, 53 and 54). The provision of the intermediate layer rather forms a further advantageous embodiment of this arrangement which, depending on its particular properties (rigid, liquid or gel), may affect the shock absorbing properties (see paragraphs 14 and 55). In E5 the shock-absorbing mechanism relies essentially again on a spherical or ball-and-socket-

like arrangement employing a specific connection arrangement between the relatively rotatable inner and outer (first and second) helmet parts, using separate devices for creating a spring or damping force for better absorbing tangential forces originating from an oblique impact (paragraphs 13 to 15 of E5). A sliding facilitator may be arranged between the first and second helmet parts to facilitate the sliding movement between them, as argued by the appellant with reference to paragraphs 16 and 17 of E5. However, these passages underline that the sliding facilitators disclosed in E5 do not constitute the actual solution but further enhancements of it (see also paragraph 38 of E5).

- 6.7.4 For these reasons the Board concluded that the subject-matter of claim 1 of the patent in suit involves an inventive step when D1 is taken as a starting point in combination with E1, E3, E4 or E5.
- 6.8 The appellant's objection submitted with the grounds of appeal and based on a combination of D1 and common general knowledge constituted an amendment to its case, as argued by the respondent. In its provisional opinion the Board stated that it did not intend to admit this objection pursuant to Articles 12(4), (6) RPBA. The appellant did not contest that this objection indeed constituted an amendment to its case. Also, during the oral proceedings the appellant did not submit any further comments, let alone any reasons why this objection should nevertheless be admitted. The Board consequently had no reason to deviate from its provisional opinion and confirmed that the objection was not admitted into the appeal proceedings.
7. The appellant's further objections based on E2 as a starting point in combination with any of E1, E3, E4 or

E5 do also not lead to a different conclusion on inventive step.

- 7.1 The appellant considered that the single distinguishing feature of claim 1 of the patent in suit over the helmet known from E2 (see above point 4.) solved the same objective technical problem as formulated within the context of the objections based on D1 (see above point 6.4).
- 7.2 For corresponding reasons already given above in points 6.5 to 6.7, the Board cannot see that any of the documents E1, E3, E4 or E5 points the skilled person to the solution according to claim 1. As has been set out above, the respective intermediate or interface layers as such do not solve the underlying technical problem.
8. In regard to a rather cursory objection based on E3 as starting point for the assessment of inventive step, submitted in the appellant's letter dated 17 June 2024, the Board had stated in its provisional opinion that this objection constituted an amendment of the appellant's case which the Board did not intend to admit (Articles 12(4), 12(6), 13(1) RPBA). In its subsequent written submission and in the oral proceedings the appellant did not submit any further comments in this regard. The Board consequently had no reason to deviate from its provisional opinion and confirms that the objection was not admitted into the appeal proceedings.

Article 100(b) EPC

9. The appellant's arguments by which it contested the conclusions in the impugned decision in regard to its objection on insufficiency of disclosure are also

considered unconvincing.

- 9.1 In its provisional opinion the Board noted that the appellant's objection raised against the subject-matter of claim 2 appeared to rely on an interpretation of a statement made by the opposition division in the impugned decision, rather than being directed to the claimed subject-matter. The appellant had argued in writing that the embodiment arising out of its interpretation from the first sentence of point 14.2.2 of the impugned decision would not be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person. Even if the cited passage of the impugned decision were to be understood in the way the appellant argued - which the Board nevertheless does not follow - the fact that some features would not be disclosed in the patent is not sufficient to conclude that corresponding claimed subject-matter is insufficiently disclosed within the meaning of Article 100(b) EPC. The skilled person may also rely on its common general knowledge when trying to carry out the claimed subject-matter. There are no arguments which create doubts that the skilled person would be unable to carry out the subject-matter of granted claim 2.

The Board further opined that for similar reasons also the further arguments of the appellant in their letters of 17 October 2023 (page 9) and 17 June 2024 (page 7) were unconvincing. In as far as these arguments could be understood at all, they did not appear to be directed to the subject-matter of the claims and the question of whether the skilled person was provided with sufficiently clear and complete information to carry out such subject-matter. Whether some effects mentioned in the patent or in the arguments of the

respondent are achieved or not is irrelevant for the question of sufficiency of disclosure if such effects are not specified in the claims.

9.2 During the oral proceedings before the Board the appellant stated to rely on its written submissions and did not add any further comment in regard to the Board's provisional opinion, which is consequently hereby confirmed.

9.3 Therefore, the ground for opposition pursuant to Article 100(b) EPC does not prejudice maintenance of the patent.

Article 100(c) EPC

10. Similarly, also the conclusions of the opposition division in regard to the ground for opposition pursuant to Article 100(c) EPC can be confirmed.

10.1 As noted in the provisional opinion, the Board agrees with the reasoning in the impugned decision that the expressions "liner" and "shell" have the same meaning throughout the application as filed (reference is made to the published international application, WO 2017/152151 A1, underlying the patent in suit). In as far as the appellant's objection is directed to the expression "rigid expanded polymer foam" used in combination with the term "shell" in paragraph 22, on which the amendment of granted claim 1 in feature E is based, the respondent pointed out that the original claim 1 already employed the expression "liner made of rigid foam". From the appellant's counter-argument on top of page 10 of its letter dated 17 October 2023 it is not apparent in which way an extension of subject-

matter could have occurred.

10.2 During the oral proceedings before the Board the appellant stated to rely on its written submissions and did not add any further comment in regard to the Board's provisional opinion, which is consequently hereby confirmed.

10.3 The ground for opposition pursuant to Article 100(c) EPC does not prejudice maintenance of the patent.

11. Absent any argument submitted by the appellant during the appeal procedure which could lead the Board to overturn the impugned decision, the appeal has to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Chavinier-Tomsic

M. Alvazzi Delfrate

Decision electronically authenticated