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**Datasheet for the decision
of 15 June 2023**

Case Number: T 2978/19 - 3.2.03

Application Number: 14715684.8

Publication Number: 2971363

IPC: E01F15/14

Language of the proceedings: EN

Title of invention:
ROADSIDE CRASH CUSHION

Patent Proprietor:
Impero, Pasquale

Opponent:
Zavod Prodmash

Headword:

Relevant legal provisions:
EPC Art. 54, 56, 100(b), 100(c)
RPBA 2020 Art. 12(3), 12(4), 12(5), 13(1)

Keyword:

Novelty - main request (yes)

Inventive step - ex post facto analysis - main request (yes)

Grounds for opposition - insufficiency of disclosure (no) -
subject-matter extends beyond content of earlier application
(no)

Statement of grounds of appeal - party's complete appeal case

Amendment to case - requirements of Art. 12(2) RPBA 2020 met
(no) - admissibly raised and maintained

Discretion not to admit submission - requirements of Art.
12(3) RPBA 2020 met (no) - submission admitted (no)

Decisions cited:

R 0008/16

Catchword:



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Case Number: T 2978/19 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 15 June 2023

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 11 September
2019 rejecting the opposition filed against
European patent No. 2971363 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman C. Herberhold
Members: R. Baltanás y Jorge
F. Bostedt

Summary of Facts and Submissions

- I. European patent No. 2 971 363 B1 relates to a roadside crash cushion.
- II. An opposition was filed against the patent based on Articles 100(c) EPC, 100(b) EPC and 100(a) EPC in conjunction with Articles 54 EPC and 56 EPC.
- III. This appeal is against the decision of the Opposition Division rejecting the opposition.

This decision was appealed by the opponent (appellant).

- IV. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA 2020), the Board indicated its preliminary opinion on the case.

Oral proceedings were held on 15 June 2023.

- V. Requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked. It also requested that documents A5 and L1 to L3 be taken into account in the appeal proceedings.

The patent proprietor (respondent) requested that the appeal be rejected as inadmissible or that it be dismissed and the patent be maintained as granted or, alternatively, that the patent be maintained on the basis of the auxiliary request filed with the reply to the statement setting out the grounds of appeal. The

respondent also requested that A5 and the submissions of the appellant filed after the appellant's statement setting out the grounds of appeal not be considered.

VI. Claim 1 as granted (main request), including the numbering of its features as adopted in the decision, reads as follows (the amendments objected to on grounds of added subject-matter are in feature 1.3.6 - which derives from claim 1 as originally filed and page 4, lines 16 to 22 - and have been marked in bold/
strikethrough compared to the wording of original claim 1):

- 1 A roadside crash cushion (1), comprising:
 - 1.1 a guide rail (2)
 - 1.1.1 fixed to a road surface;
 - 1.2 a plurality of sliding supports (3)
 - 1.2.1 which slidably engage along the guide rail (2);
 - 1.3 a plurality of collapsible tubular elements (4),
 - 1.3.1 which are made of a metal and/or a composite and/or a plastic material,
 - 1.3.2 which are arranged horizontally one following another,
 - 1.3.3 which are supported by the plurality of sliding supports (3)
 - 1.3.4 and which each have a straight development axis
 - 1.3.5 and are fixed to the plurality of sliding supports (3);
 - 1.3.6 wherein each collapsible tubular element (4) of the plurality of collapsible tubular elements (4) has a length and a transversal section that are ~~related in a relation~~ to one another such as to determine ~~a collapse an irreversible compressive deformation~~ of the collapsible tubular element (4) **which determines the**

collapse thereof along the development axis thereof when the collapsible tubular element (4) is subjected to an axial force that is at least equal to a critical force value;

- 1.2.2 wherein each sliding support (3) of the plurality of sliding supports (3) comprises a fixing plate (14)
- 1.2.3 and a carriage (15)
- 1.2.4 which is connected to the fixing plate (14)
- 1.2.5 and which engages with the guide rail (2); the roadside crash cushion (1) being characterized in that:
 - 1.5 it comprises a plurality of connecting plates (20)
 - 1.5.1 that are used in substitution in a certain corresponding number of sliding supports (3) of the plurality of sliding supports (3)
 - 1.5.2 and that only have to separate two consecutive collapsible tubular elements (4)
 - 1.5.3 for ensuring that they axially incur the plastic compressive deformation;
- 1.3.7a each collapsible tubular element (4) of the plurality of collapsible tubular elements (4) is provided with: a first end (10) fixed to the fixing plate (14) of a first sliding support (11) of the plurality of sliding supports (3)
- 1.3.7b or to a first connecting plate (21) of the plurality of connecting plates (20);
- 1.3.8a a second end (12) fixed to the fixing plate (14) of a second sliding support (13) of the plurality of sliding supports (3)
- 1.3.8b or a second connecting plate (22) of the plurality of connecting plates (20).

VII. In view of the outcome of the proceedings, the wording of the auxiliary request is not relevant for this decision.

VIII. Prior art

The following documents - filed during the opposition period and cited in the grounds of appeal and during the opposition proceedings - are relevant to this decision:

D1: US 4,190,275 A
D2: US 6,179,516 B1
D3: US 2012/0082511 A1
D4: WO 2006/118367 A1
D5: WO 2008/143393 A1
D6: KR 20-0376121
D6a: English translation of D6
D7: US 4,583,716 A
D8: US 5,112,028 A
D9: US 2005/0211520 A1
D10: US 3,982,734 A
D12: US 3,944,187 A
D13: US 4,674,911 A
D14: US 4,399,980 A

The following document was filed after the opposition period and cited in the grounds of appeal and during the opposition proceedings:

A5: Mandatory Appendix to Opposition,
17 March 2019

The appellant filed the following document for the first time during the appeal proceedings with its submissions dated 10 May 2021:

L1: Technical opinion, 7 May 2021

The appellant filed the following documents for the first time with its submissions dated 21 January 2022:

L2: Interpretation of the experiments described in the affidavit of 21 January 2022

L3: Affidavit of Drofa Marat Aleksandrovich, 21 January 2022

IX. The appellant's arguments relevant to this decision can be summarised as follows.

(a) Admissibility of the appeal

The appellant referred to its submissions in writing.

(b) Sufficiency of disclosure and admittance of A5, L1, L2 and L3

The main inventive concept was the replacement of sliding supports with connecting plates (feature 1.5.1), but the patent did not provide any guidance for the skilled person as to how to reduce this concept to practice. Claim 1 merely expressed a wish. The enormous number of possibilities for replacing sliding supports in a road crash cushion represented an undue burden for the skilled person, who had to find out which combinations of sliding supports and connecting plates could achieve the defined irreversible compressive deformation.

Furthermore, feature 1.5.3 (for ensuring that they axially incur the plastic compressive deformation) defined an effect explicitly attributed to the connecting plates substituting the sliding supports in the manner defined in feature 1.5.2 (that they only have to separate two consecutive collapsible tubular elements). As extensively discussed in the opposition proceedings with reference to the mathematical considerations set out in document A5, in particular under point 2.4, this effect was impossible to achieve by such means according to the laws of nature in view of the lack of guidance for the deformation once the sliding supports were replaced. The claim language of features 1.5.2 and 1.5.3 was clear and did not need any further interpretation. Paragraph [0040] of the patent specification merely concerned a preferred embodiment of the claimed invention and not the claimed invention according to its broadest scope, thus it could not be interpreted as a general restriction. Furthermore, this paragraph did not disclose what the support of the sliding supports was "adequate" for. Thus, the disclosed support might be adequate merely as a support in preventing the crash cushion from falling to the ground and not in ensuring axial deformation.

Concerning feature 1.3.6, any tubular element would collapse when a sufficient axial force was applied. The feature was therefore not limiting. However, if this feature were considered limiting because not all materials behave in this way, this would mean that there was something special in the construction that was not disclosed in the patent.

Submissions A5, L1, L2 and L3 were scientific arguments which explained mathematically why the invention could

not be implemented and were therefore highly relevant and supportive of the above line of argument.

Document A5 was filed before the date fixed under Rule 116(1) EPC and was extensively referred to during the oral proceedings before the Opposition Division in relation to the ground for opposition under Article 100(b) EPC. Point 3.1 of the minutes showed that all written submissions were maintained by the then opponent, and the absence of a corresponding point in the decision showed that the Opposition Division did not decide against the admittance of A5. Finally, the statement setting out the grounds of appeal also made reference to A5. Thus, A5 should be part of the appeal proceedings.

L1, L2 and L3 were filed in response to the reply of the respondent to the statement setting out the grounds of appeal in support of the applicability of the Euler formula. They had been provided as early as possible, taking into account the fact that the experiments behind L1, L2 and L3 had to be prepared and that this took some time since it was not easy to find a tube which behaved as in the preamble of claim 1.

(c) Added subject-matter

Claim 1 comprised added subject-matter extending beyond the original disclosure.

To begin with, feature 1.3.6 did not represent a limitation of the scope of protection since all tubular elements complied with the requirements of this feature.

The amendments in feature 1.3.6 changed the subject-matter of claim 1. According to granted claim 1, the length and transversal section of the collapsible tubular element merely determined an irreversible compressive deformation which was not to be equated with a collapse. Since the word "collapse" implied an immediate destruction by a severe deformation, this was not the same as a "deformation". Furthermore, there was no such thing as a "partial collapse" as this contradicted the concept of a "collapse".

Even if feature 1.3.6 could be found literally in lines 16 to 22 of page 4 of the originally filed description, this feature was only disclosed there for a particular embodiment and in combination with other features which had been omitted in claim 1 as granted.

Firstly, the embodiment from which feature 1.3.6 had been extracted explicitly required that the road crash cushion did not comprise support and guide bars (page 4, line 23).

Secondly, the collapsible tubular element defined a hexagonal cell (see page 6, lines 5 to 7).

These two omitted features had to be considered compulsory since the optional features of the embodiment were clearly distinguished in the description by the use of the word "preferably", which was not used in relation to the omitted features. For the same reason, the use of the word "vantaggiosamente" (advantageously) in the originally filed Italian PCT application did not imply an optional absence of support and guide bars. Furthermore, the fact that the hexagonal cell was optionally to be formed by a first portion and a second portion (see

originally filed page 5, lines 20 to 22) did not mean that the hexagonal cell was optional since all embodiments disclosed this feature and originally filed page 3, lines 23 to 25 made clear that the figures disclosed embodiments of the invention.

(d) Novelty

The subject-matter of claim 1 was not novel over D1. Connecting plates were formed in D1 by connecting the two end surfaces of the tubular elements (plastic sheets (22); see Figures 3 and 8 and column 2, lines 38 to 40).

D2 also anticipated the subject-matter of claim 1. The barrels forming the "compressible tubular elements" comprised strengthened end faces in contact with each other, thus defining "connecting plates" within the meaning of claim 1.

The invention was also anticipated by the embodiment disclosed in Figures 10a to 10c of D6. It had to be taken into account that all materials eventually deform plastically when enough force is applied and that claim 1 did not define in what context the "critical force value" (feature 1.3.6) occurred. Thus, claim 1 encompassed embodiments in which the "critical force value" did not have to be the result of the normal use of a road crash cushion but could be a much higher value. Since the waste tyres of D6 were not indestructible and since it was possible to deform them plastically by applying sufficient force, feature 1.3.6 was disclosed by this document. Furthermore, the substitution of the sliding supports with connecting plates was disclosed in D6 since a connection between waste tyres was carried out using connecting plates

(400) (separate plate member) for which no supporting slide (130) (diaphragms) was provided.

Concerning D7, the expression "mounted upon" in lines 27 to 31 of column 3 implied a fixation of the compressible tubular elements (buffer elements (14)) to the connecting plates (interior panels (22)), as defined in features 1.3.7b and 1.3.8b. Furthermore, the reinforcements (50, 68) on the diaphragm members (24) corresponded to the carriages defined in feature 1.2.3 since they engaged the guide rail formed by the wires (48, 66). It had to be taken into account as well that claim 1 did not define that the straight development axis of the tubular collapsible element defined in features 1.3.4 and 1.3.6 had to be arranged horizontally during use. Moreover, as for D6, claim 1 did not define that the irreversible compressive deformation defined in feature 1.3.6 had to occur during the normal use of the road crash cushion.

The subject-matter of claim 1 was also not novel over D3, D4, D5 or D9 as discussed in writing. Concerning D9, the only requirements of a "fixing plate" within the meaning of claim 1 were that the fixing plate be connected to a carriage (feature 1.2.4) and that it be connected to an end of the tubular element (features 1.3.7 and 1.3.8). Since the "structural frames" disclosed in paragraphs [0031] and [0032] of D9 fulfilled these conditions, they were fixing plates as in the claim. Moreover, tubular elements not supported by the support posts in D9 were connected to other tubular elements at their ends (see the holes provided for this purpose shown in Figure 2), thus forming connecting plates.

(e) Inventive step

The subject-matter of claim 1 did not involve an inventive step over the combination of D6 and D8. The distinguishing feature, if any, compared to D6 was only the irreversible character of the compressive deformation (feature 1.3.6). The technical effect of this distinguishing feature was that the compressive deformation was irreversible. Therefore, the objective technical problem was how to achieve this technical problem, i.e. how to modify D6 such that the road crash cushion could not be reused. The skilled person would consult D8 since it belonged to the same technical field and explicitly dealt with reusability (see column 4, lines 54 and 55). The skilled person would learn from D8 that metal elements could be used if reusability was not desired. Following this teaching, the skilled person would thus have replaced the waste tyres of D6 with equivalent tubular metal elements to ensure that the road crash cushion could not be reused.

Alternatively, the skilled person would also arrive at the claimed invention by combining D9 with their common general knowledge. According to the patent specification, D9 disclosed the preamble of claim 1. No technical effect was associated with the substitution of sliding supports with connecting plates, only a foreseeable worsening, this being sufficient to show the absence of an inventive step. The only objective technical problem which could possibly be considered was to reduce the number of parts to facilitate the assembly of the crash cushion. Looking at the figures (e.g. Figure 3A), only two alternatives were conceivable for achieving this: reducing the material used in the tubular elements (310) or the sliding supports (comprising posts (312)). In the last case, it

was obvious to cut the posts (312) for this purpose, thus only leaving the fixing plates. The presence of such fixing plates was disclosed in paragraph [0032] (frames), Figure 3A (disclosing plates) and Figure 2 (disclosing the holes for fixing the plates). The obvious modification thus led to an embodiment falling under the subject-matter of claim 1.

Moreover, as discussed in writing, the subject-matter of claim 1 did not involve an inventive step over D7 combined with the common general knowledge either. Since the technical effect of "fixing" the elements was that the elements were mutually connected, the solution of fixing them was obvious for the skilled person.

Finally, the subject-matter of claim 1 also did not involve an inventive step over the combination of any of D10, D12 or D13 with D2 or D14. The shattering and powdering of the container with energy cells in D10 was an ultimate form of irreversible deformation, while the plastic deformation requirement of claim 1 was only a feature of suitability.

X. The respondent's arguments relevant to this decision can be summarised as follows.

(a) Admissibility of the appeal

Most arguments of the appellant were to be disregarded for lack of a causal relationship between them and the reasons given by the Opposition Division in the contested decision. For at least two out of three grounds for opposition, no causal relationship was present, and the appeal was thus to be held inadmissible.

(b) Sufficiency of disclosure and admittance of A5, L1, L2 and L3

The patent specification provided the skilled person with all necessary information to reproduce the invention, in particular in view of the embodiment disclosed in Figures 4, 5 and 6 and paragraph [0040].

None of the late-filed documents should be admitted into the appeal proceedings.

A5 was late filed in opposition, and its admittance had been objected to by the patent proprietor during opposition proceedings. Its content had not been discussed during the oral proceedings before the Opposition Division, as was obvious from the minutes and the impugned decision. Furthermore, the document was not prima facie relevant since it described a case which was not according to claim 1 and since the Euler formula was incorrectly applied.

L1, L2 and L3 were filed after the statement setting out the grounds of appeal and should therefore not be admitted under Article 13(1) RPBA 2020. The documents were not prima facie relevant since the described experiments did not fit with the combination of features of claim 1.

(c) Added subject-matter

Originally filed claim 1 encompassed plastic or elastic deformation, and feature 1.3.6 - which defined the plastic deformation - had a verbatim basis in lines 16 to 20 of originally filed page 4.

The "hexagonal cell" feature was optional since the first portion and second portion which formed the hexagonal cell were disclosed as optional.

The absence of support and guide bars was mentioned on page 4, lines 23 merely as an advantage achieved in the context of the invention. It was not disclosed as an essential feature of it and, consequently, had not been a part of the definition of the invention in claim 1 as originally filed. Furthermore, the originally filed PCT application in Italian - which was to be considered the authentic text of the patent application - by using the word "vantaggiosamente", explicitly disclosed that the absence of support and guide bars in the embodiment was merely an advantageous option (see page 5, line 23 of the originally filed application in Italian).

(d) Novelty

D1 did at least not clearly and unambiguously disclose at least connecting plates but just a face-to-face contact of the plastic sheets (22). Thus, features 1.5, 1.5.1, 1.5.2 and 1.5.3 were not anticipated by D1.

In the same way, D2 did not disclose connecting plates either.

D6 disclosed that the road crash cushion was reusable since the shape of the waste tyres was recovered after an impact (see D6a, last two lines of page 7 and first three lines of page 8). Thus, the compressive deformation was not irreversible, contrary to the requirements in feature 1.3.6. Furthermore, the plates (400) of D6 were not disclosed as substituting sliding supports (130).

Several features of claim 1 were missing from D7. The document did not disclose a carriage within the meaning of claim 1. D7 merely disclosed that the buffer elements (14) were enclosed by the interior panels (22) but not that they were fixed to them as defined in features 1.3.7b and 1.3.8b. Furthermore, no deformation or collapse along the development axis of the tubular buffer elements (14) was disclosed, contrary to feature 1.3.6.

(e) Inventive step

The objective technical problem formulated by the appellant when starting from D6 contained a pointer towards the solution, thus it was not admissible. D6 and D8 show a different type of construction (tubular elements vs horizontal sheets), and the skilled person would not take any element from one and add it to the other. The reasoning of the appellant did not explain what precise elements the skilled person would consider replacements for the waste tyres of D6 and why the connecting plates had to be kept after this replacement. The correct technical effect to be considered was the one disclosed in paragraph [0015] of the patent specification, which was related to a better absorption capacity of the plastic deformation.

The objection starting from D9, which discloses neither connecting nor fixing plates, did not explain where the knowledge about implementing fixing **plates** came from.

None of D10, D12 or D13 disclosed feature 1.3.6 (plastic deformation).

The subject-matter of claim 1 differed from D7 by more features than the one considered by the appellant. The

appellant did not explain how the skilled person would arrive at these features, therefore the attack could not succeed.

Reasons for the Decision

1. Admissibility of the appeal - Rule 99(2) EPC

The parties did not put forward any new arguments on the admissibility of the appeal during the oral proceedings. Therefore, the Board remains of the opinion it expressed in the communication under Article 15 RPBA 2020 and does not find the reasons of the respondent persuasive.

The respondent acknowledged that the appellant provided reasons for setting aside the contested decision at least for some of the objections under Article 100(a) EPC (see reply to the statement setting out the grounds of appeal, first and last sentence of the paragraph bridging pages 27 and 28). The fact that for at least one ground for opposition reasons were provided for setting the contested decision aside alone prevents the appeal from being inadmissible since the admissibility of an appeal can only be assessed as a whole (Case Law of the Boards of Appeal, 10th edn., V.A.2.6.8).

In addition, the fact that a submission of the appellant may not be persuasive in substance is no reason for considering the appeal unsubstantiated to the extent that it is inadmissible. It is the right of the appellant to put forward the line of reasoning it sees fit for its interests. The submissions of the appellant in the statement setting out the grounds of appeal concern the objections in dispute and aim at

explaining why it considers the reasons given in the contested decision not appropriate. These reasons are, independently of their merits, sufficient for the requirements of Rule 99(2) EPC to be considered fulfilled. The respondent's position on these arguments relates to their suitability for justifying a revision of the decision rather than to the lack of a substantiation of the grounds of appeal.

In view of the above, the appeal is admissible.

2. Admittance of A5

2.1 A5 in the opposition proceedings - Article 12(2) RPBA 2020

Document A5 was filed by the opponent (now appellant) during the opposition proceedings and before the final date fixed by the Opposition Division under Rule 116(1) EPC.

The patent proprietor (now respondent) objected to its admittance during the oral proceedings before the Opposition Division (see point 1.2 of the minutes).

According to the minutes, the discussion on its admittance was made conditional on the use of it by the opponent (see point 1.3 of the minutes). No further use of A5 by the opponent, or of the submissions made in it, is mentioned in the minutes. The decision of the Opposition Division does not contain any reference to A5.

The appellant insists that in the discussion on sufficiency of disclosure, it repeatedly referred to the mathematical considerations in document A5. At

least the document's part dealing with sufficiency of disclosure was thus to be considered part of the Opposition Division's decision. It conceded that the other parts of the document did not play a part during the oral proceedings in opposition.

The Board concludes from this that the Opposition Division did at least not explicitly decide on the admittance of A5. In addition, the decision is not based on this document within the meaning of Article 12(2) RPBA 2020, at least for the parts not on sufficiency of disclosure.

- 2.2 A5 as part of the statement setting out the grounds of appeal - Article 12(3) and (4) RPBA 2020
 - 2.2.1 The appellant referred to A5 in its statement setting out the grounds of appeal. Even if a mere reference to submissions filed during opposition proceedings normally does not suffice for considering the content of these to have been filed in appeal (see point 2.3 below), the mention of section 2.4 of A5 in a mathematical discussion (see statement setting out the grounds of appeal, page 6, fourth paragraph onwards) allows an assessment of **this content** of A5 without putting an undue burden on the Board and the respondent. This portion of A5 is thus considered to be part of the appellant's complete case within the meaning of Article 12(3) RPBA 2020.
 - 2.2.2 A5 was filed after the opposition period and was thus late filed. As mentioned above, the document's content is not referred to in the decision of the Opposition Division, although the appellant insists that its content was referred to during the oral proceedings and thus had to be taken into account for sufficiency of

disclosure. Nevertheless, the technical content of point 2.4 of A5 corresponds to technical considerations related to the discussion about Article 100(b) EPC in opposition proceedings, and while there is not a trace of its content in the decision, there is also no trace that the then opponent did not maintain this submission. Thus, the Board - giving the appellant the benefit of the doubt - accepts that point 2.4 of A5 was admissibly raised and maintained in the proceedings leading to the decision under appeal. Consequently, it is not an amendment within the meaning of Article 12(4) RPBA 2020.

- 2.2.3 As **point 2.4 of A5** is not an amendment and is part of the case presented with the statement setting out the grounds of appeal, there is no reason to exclude **this part** of A5 from the appeal proceedings.

- 2.3 Content of A5 not part of the statement setting out the grounds of appeal - Article 12(3), (5) and (6) RPBA 2020 and Article 13(1) RPBA 2020
 - 2.3.1 The mere reference to A5 "by full reference" in the statement setting out the grounds of appeal (see last paragraph of page 1) cannot substantiate the use of A5 as a whole in the appellant's case (see Case Law of the Boards of Appeal, 10th edn., V.A.3.2.2, in particular R 8/16, Reasons 38). Thus, A5 (excluding section 2.4; see above point 2.2) is **not part** of the complete case presented by the appellant under Article 12(3) RPBA 2020.

 - 2.3.2 A similar reference "in full" was made in the letter dated 22 February 2021 (see penultimate paragraph of page 1) which cannot amount to a substantiation of the relevant content of A5 on the same grounds as above.

2.3.3 Finally, a reference to pages 6 and 7 of A5 was made in the letter of the appellant dated 13 April 2022 (see second paragraph of page 15) in the discussion about the effect of wall thickness and material properties. However, no reasons were provided in this letter as to why this was only raised after the statement setting out the grounds of appeal. In any case, the technical aspects discussed are not relevant in view of the interpretation of claim 1 by the Board (see point 4.2 below).

For the above reasons, the Board does not admit the content of A5 (apart from section 2.4) into the appeal proceedings since it was either never substantiated - concerning its content apart from pages 6 and 7 and section 2.4 - or late filed and not prima facie relevant (Article 13(1) RPBA 2020).

3. Admittance of L1, L2 and L3 - Article 13(1) RPBA 2020

Documents L1, L2 and L3 were filed after the appellant had filed its statement setting out the grounds of appeal. Thus, the Board has discretion to decide on their admittance under Article 13(1) RPBA 2020.

L1, L2 and L3 were filed in connection with the objection under Article 100(b) EPC. They relate to experiments carried out to show that just replacing a sliding support with a connecting plate cannot result in the effect of axially incurring "the plastic compressive deformation" (feature 1.5.3).

As the Board interprets claim 1 in a way which does not imply that only replacing the sliding supports with connecting plates results in this effect (see point 4.1

below), the content of L1, L2 and L3 is not prima facie relevant for the outcome of the case.

Thus, L1, L2 and L3 are not admitted into the appeal proceedings.

4. Sufficiency of disclosure - Article 100(b) EPC

4.1 Interpretation of feature 1.5.3 (for ensuring that they axially incur the plastic compressive deformation)

The appellant argued that claim 1 defined the effect of feature 1.5.3 as a consequence of replacing some sliding supports with connecting plates (features 1.5 and 1.5.1) such that the connecting plates only separate two consecutive collapsible tubular elements (feature 1.5.2). The claim thus required the connecting plates - and them only - to ensure the axial compression, which was technically not possible, as shown by theoretical considerations and experiments. As the claim language was clear, it did not need any further interpretation and, in any case, paragraph [0040] of the patent specification merely concerned a preferred embodiment of the invention.

This is not persuasive.

Feature 1.5.3 has to be interpreted in a way which makes technical sense in view of the whole patent specification. The skilled person reading the patent specification understands the guiding role of the sliding supports engaged in the guide rail (features 1.2, 1.2.1 and 1.2.2 to 1.2.5) during the irreversible compressive deformation defined in feature 1.3.6 (i.e. "**the** plastic compressive deformation" of feature 1.5.3).

Even if the skilled person's common technical knowledge were not enough to allow them to understand this, paragraph [0040] of the patent specification makes it clear that the sliding supports "**are still necessary for supporting the plurality of collapsible tubular elements (4) (4), but they can be used in a smaller number, in the amount necessary for guaranteeing an adequate support to the collapsible tubular elements (4)**" (see column 6, lines 16 to 21; emphasis added). This has the advantage of being "*less unwieldy and less expensive than the sliding supports (3) as they only have to separate two consecutive collapsible tubular elements (4) for ensuring that they axially incur the plastic compressive deformation (folding) which has been discussed in the preceding*" (see column 6, lines 21 to 27; emphasis added). In other words, a sufficient number of sliding supports has to be present to ensure that the axial plastic compressive deformation warranted by the guiding of the sliding supports along the guide rail still occurs. Consequently, the effect defined in feature 1.5.3 cannot be attributed only to the substitution of sliding supports with connecting plates (i.e. it is not based on the connecting plates alone).

In view of this interpretation of feature 1.5.3, the arguments of the appellant based on an alleged lack of disclosure of how to achieve the axial plastic compressive deformation by means of only substituting sliding supports with connecting plates must fail.

4.2 Disclosure of the substitution of sliding supports

4.2.1 The appellant argued that the patent did not provide any guidance for the skilled person as to how to

substitute sliding supports with connecting plates. Therefore, the enormous number of possibilities for replacing sliding supports in a road crash cushion represented an undue burden for the skilled person.

- 4.2.2 However, this is based on an incorrect interpretation of claim 1 as a whole. The argument of the appellant amounts to saying that the invention consists of the modification of a known roadside crash cushion comprising tubular elements fulfilling feature 1.3.6 fixed to an optimised minimal number of sliding supports. According to the appellant, the skilled person would not be able to substitute some of these sliding supports in the known roadside crash cushion with connecting plates (as defined in features 1.5 to 1.5.3) without incurring lateral bending of the tubular elements connected by a connecting plate in an impact - as allegedly proved by the mathematical considerations supported by, among others, A5, L1, L2 and L3.

This interpretation is not convincing.

- 4.2.3 Claim 1 defines a set of conditions which must be **simultaneously fulfilled** by the invention. In this case, considering first the invention of the preamble of claim 1 and then attempting to modify it along the lines of the characterising portion, similar to a kind of "problem-solution approach", is not appropriate.

Feature 1.3 defines collapsible tubular elements supported by a plurality of sliding supports (features 1.2 and 1.3.3).

Feature 1.3.6 defines some properties of **each** collapsible tubular element.

Features 1.5 to 1.5.3 define connecting plates arranged "*in substitution in a certain corresponding number of sliding supports*" (1.5.1) that separate two consecutive collapsible tubular elements (1.5.2). The skilled person understands from the ensemble of features 1.5.1, 1.5.2 and 1.3.3 that some consecutive tubular elements are connected by connecting plates, while the ensemble of the tubular elements is still supported by sliding supports. This does not mean that the number of sliding supports is already at its absolute minimum possible so that any replacement of a sliding support with a connecting plate will render the cushion instable when a crash occurs. Instead, the skilled person learns from paragraph [0040] to use both connecting plates and sliding supports together - with the sliding supports being used in smaller numbers but still in the amount required to ensure adequate support. The term "adequate" in this context has to be read with a mind willing to understand the invention and thus means "adequate to ensure proper behaviour during compressive deformation" and not just - as argued by the appellant - to prevent the cushion from falling to the ground.

Feature 1.5.3 defines that the claimed arrangement results in that the tubular elements "*axially incur **the plastic compressive deformation***" (emphasis added). This plastic deformation can only be the one defined in feature 1.3.6 (irreversible compressive deformation which determines the **collapse** of each tubular element along its development axis). Irrespective of the clarity aspects of this feature (which are not a ground for opposition), a limitation is defined by this feature. The resulting structure must be such that a deformation as defined in feature 1.3.6 takes place (see preceding point 4.1). In this context, the description of the patent specification repeatedly

refers to a "folding deformation" of the collapsible tubular element. According to paragraph [0020], it is known to design collapsible tubular elements such that an axial force determines a plastic compressive deformation (folding) without any need to use any support or guide bars (see column 3, line 54 to column 4, line 1 and also column 4, lines 6 to 10), the collapsible tubular elements of the invention being designed in line with this principle (see column 4, lines 1 to 3). Furthermore, according to paragraph [0025], ribs developing along a perpendicular pathway with respect to the development axis of the collapsible tubular element can be used, which are "conformed" to guide the plastic deformation of the collapsible tubular element. Such collapsible tubular elements are shown in the figures with repetitive inwardly curved annular wall sections prone to collapse. This information of the patent specification is sufficient to enable the skilled person to put the invention into practice. Axially compressible elements are known to the skilled person, a fact which is consistent with such elements being also disclosed, for example, in prior-art documents D2, Figures 10 to 13 and D9, Figure 1D.

4.3 Feature 1.3.6 (collapse when subjected to a critical force value)

4.3.1 With respect to feature 1.3.6, the appellant argued firstly that any tubular element would collapse when a sufficient axial force was applied.

This cannot support an objection of lack of disclosure since the argument inherently implies that any tubular element behaves in the claimed way. Thus, as soon as the skilled person arranged any tubular element, this

feature of the invention would be automatically implemented. No lack of disclosure can be seen in this.

- 4.3.2 In the alternative, the appellant argued that if this were not the case, the patent specification would fail to disclose what rendered the collapse possible when the "critical force value" was applied.

This argument is likewise not persuasive. The skilled person with knowledge of mechanics is well aware of how to produce a collapsible tubular element which behaves as defined in feature 1.3.6, as discussed above. Furthermore, one way of implementing this feature is disclosed in the patent specification (see paragraphs [0020] and [0025] and the disclosure of ribs (9) in the figures).

5. Added subject-matter - Article 100(c) EPC

- 5.1 Alleged non-limiting character of feature 1.3.6

The appellant argued in the first place that feature 1.3.6 did not represent a limitation of the scope of protection since all tubular elements complied with the requirements of this feature.

However, even if this were the case, the Board cannot see any implication for the issue of added subject-matter. It is only relevant in this respect whether the feature was disclosed in the originally filed application.

- 5.2 Basis of feature 1.3.6

The arguments of the appellant on the alleged absence of a necessary collapse in feature 1.3.6 of granted

claim 1 are not convincing since feature 1.3.6 has an almost literal basis in lines 16 to 22 of originally filed page 4 (i.e. of the A1 publication of the PCT application). The correspondence of this passage with feature 1.3.6 has not been disputed.

5.3 Alleged unallowable intermediate generalisation

5.3.1 Thus, the only relevant question for the discussion about added subject-matter is whether feature 1.3.6 was originally disclosed only in connection with other inextricably linked features missing from granted claim 1.

The Board concludes that this is not the case for the following reasons.

5.3.2 The appellant argued that feature 1.3.6 was originally disclosed only in combination with:

- the absence of support and guide bars
- collapsible tubular elements defining a hexagonal cell

These two features were not disclosed as "preferable" in the originally filed description and were therefore to be regarded as compulsory in the embodiment from which feature 1.3.6 was extracted.

This is not persuasive.

5.3.3 Originally filed claim 1, which disclosed the invention in its broadest terms, did not define the absence of guide and support bars as a feature of the invention. Thus, the skilled person reading the original disclosure is aware that the invention concerns a

roadside crash cushion as defined in originally filed claim 1 and that although the absence of support and guide bars is mentioned as an **advantage** of the invention (see page 3, lines 7 to 9) and is also mentioned in the context of the example (page 4, lines 23), the invention was claimed without this feature. Thus, when reading line 23 of page 4, they would immediately understand that the information presented corresponds to this advantage, as correctly considered by the Opposition Division. As a consequence, even if not including the feature "does not comprise support and guide bars" in the definition of the claim were to be seen as an intermediate generalisation over the disclosure of the embodiment, it would be an allowable intermediate generalisation as this level of generalisation was originally disclosed in the wording of claim 1 as filed.

- 5.3.4 Concerning the "hexagonal cell", this feature is originally disclosed in connection with a collapsible tubular element formed by a first and a second portion (see page 6, lines 5 to 7). As the first and second portions are explicitly disclosed as optional (see page 5, lines 20 to 22), the hexagonal shape used for them is likewise to be seen as optional.

Originally filed page 3, lines 23 to 25 states that **"specific embodiments of the invention will be described in the following description [...] with the aid of the appended tables of drawings"** (emphasis added). Nothing in this sentence implies that the **general invention** must comprise all features disclosed in the drawings, let alone the hexagonal cell feature.

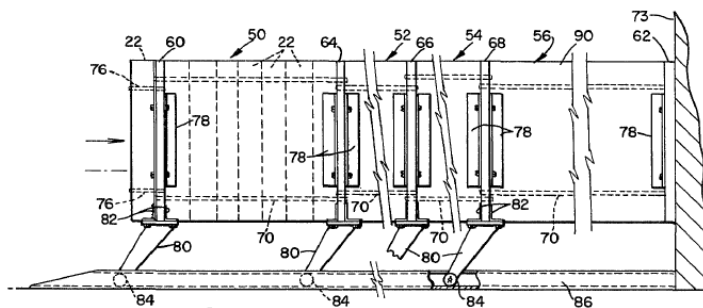
6. Novelty - Article 54(2) EPC

6.1 D1

6.1.1 Granted claim 1 defines "connecting plates" (feature 1.5) **used in substitution** in a certain corresponding number of sliding supports of the plurality of sliding supports (feature 1.5.1) that only have **to separate two consecutive** collapsible tubular elements (feature 1.5.2). Features 1.3.7a, 1.3.7b, 1.3.8a and 1.3.8b further specify that an end of the collapsible tubular element can be **fixed** to the fixing plate of a sliding support or **to a connecting plate**.

Thus, the connecting plate in claim 1 must be a **separate and distinguishable** element that provides the same fixing function as the fixing plate of the sliding supports. Furthermore, it must be **a plate** by definition, as the skilled person understands from the mere reading of claim 1.

6.1.2 Document D1 discloses modules comprising a series of expanded plastic sheets (22) sandwiched in face-to-face contact (see column 2, lines 38 to 40 and also Figure 8 reproduced below).



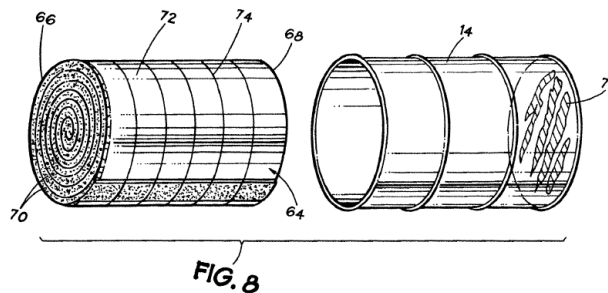
Even if the plastic sheets (22) could be considered "collapsible tubular elements" within the meaning of

claim 1, the mere mutual contact of their faces does not represent a "connecting plate" within the meaning of claim 1 since no separate and distinguishable element can be seen to which the collapsible tubular elements are fixed in a similar manner to the fixing plates (60, 64, 66, 68) of the sliding supports (80).

6.1.3 Thus, the subject-matter of claim 1 differs from D1 at least in the features related to the connecting plates (1.5, 1.5.1, 1.5.2, 1.3.7b and 1.3.8b).

6.2 D2

D2 discloses barrels (14) containing a crushable module (64) (see paragraph bridging columns 3 and 4 and Figure 8 reproduced below). The argument of the appellant according to which the strengthened end faces of the barrels represented "connecting plates" within the meaning of claim 1 cannot be accepted in view of the interpretation of this feature that the Board has adopted (see point 6.1.1 above). Even if the barrels (14) could be regarded as "collapsible tubular elements" and comprised strengthened ends - and even if the barrels were connected to each other, these ends would not be a separate and distinguishable element to which the barrels (14) - as a whole - would be fixed in a similar way as to the sliding supports (38).



6.3 D6

6.3.1 D6 discloses a roadside crash cushion (see D6a, page 1, "Background of the invention"), comprising:

a guide rail (Figure 7; 200) fixed to a road surface;
a plurality of sliding supports (130) which slidably engage along the guide rail (200);
a plurality of collapsible tubular elements (101), which are made of a plastic material, which are arranged horizontally one following another (see Figure 10a), which are supported by the plurality of sliding supports (130) and which each have a straight development axis and are fixed to the plurality of sliding supports (130);

wherein each sliding support (130) of the plurality of sliding supports (130) comprises a fixing plate (120, 121) and a carriage (210) which is connected to the fixing plate (120, 121) and which engages with the guide rail (200);

the road side crash cushion comprising a plurality of connecting plates (400) that only have to separate two consecutive collapsible tubular elements (101);

each collapsible tubular element (101) of the plurality of collapsible tubular elements (101) being provided with:

a first end fixed to the fixing plate (120, 121) of a first sliding support (130) of the plurality of sliding supports (130) or to a first connecting plate (400) of the plurality of connecting plates (400);

a second end fixed to the fixing plate (120, 121) of a second sliding support (130) of the plurality of sliding supports (130) or a second connecting plate (400) of the plurality of connecting plates (400).

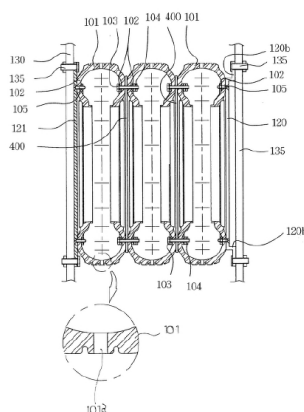
This was not contested.

Thus, D6 discloses features 1, 1.1, 1.1.1, 1.2, 1.2.1, 1.3, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.5, 1.5.2, 1.5.3, 1.3.7a, 1.3.7b, 1.3.8a and 1.3.8b.

6.3.2 The respondent argued that the plates (400) of D6 were not disclosed as substituting sliding supports (130) (feature 1.5.1).

However, this is not persuasive since the only requirement for the connecting plates within the meaning of claim 1 is that they can be used for fixing the collapsible tubular elements in a similar manner to the fixing plates of the sliding support (see point 6.1.1 above).

Since the collapsible tubular elements (waste tyres (101)) of D6 are fixed to the plates (400) - see fixing bars (102), bolts (103) and nuts (104) in Figure 10a reproduced below - and to the fixing plates (120, 121) basically in the same way, the plates (400) represent connecting plates used to substitute a certain corresponding number of sliding supports (130) of the plurality of sliding supports (130) as defined in feature 1.5.1. This feature is thus disclosed by D6.



6.3.3 The appellant argued that claim 1 encompassed embodiments in which the "critical force value" causing an irreversible compressive deformation (feature 1.3.6) did not have to be the result of the normal use of a road crash cushion but could be a higher value.

The Board is not persuaded by this argument.

The literal reading of the claim proposed by the appellant does not make technical sense in the technical field of the invention. The claimed invention is a roadside crash cushion (feature 1). The skilled person reading claim 1 understands that the forces causing the deformation defined in the claim must be in the order of magnitude encountered during normal use of the roadside crash cushion since the deformation is responsible for absorbing the energy associated with these forces. This energy absorption during a vehicle crash is the inherent aim of a roadside crash cushion.

Consequently, when interpreting claim 1 in a way which makes technical sense, the irreversible compressive deformation defined in feature 1.3.6 must be the consequence of the normal use of a roadside crash cushion (i.e. due to a vehicle impact).

6.3.4 D6 discloses that the waste tyres (101) recover their shape after a collision thanks to the openings (101a), which allow air to be expelled or absorbed (see D6a, page 5, second paragraph; page 6, lines 22 to 24; and also paragraph bridging pages 7 and 8). This represents a reversible deformation of the "collapsible tubular elements" (101) and not an "irreversible compressive deformation" as defined in feature 1.3.6.

As there is no clear and unambiguous disclosure of an "irreversible compressive deformation" of the waste tyres (101) of D6 during normal use of the roadside crash cushion, feature 1.3.6 is not disclosed in this document.

6.4 D7

6.4.1 The appellant argued that claim 1 did not define that the straight development axis of the tubular elements defined in features 1.3.4 and 1.3.6 had to be arranged horizontally during use.

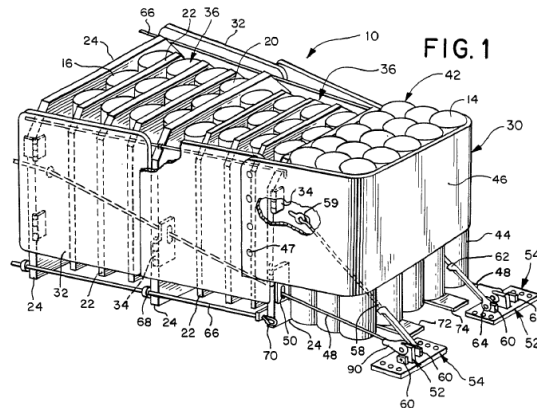
This is not persuasive in view of the interpretation of claim 1 from the viewpoint of the skilled person.

Claim 1 relates to a road crash cushion in which several features are defined concerning a deformation resulting in the absorption of energy typical for roadside crash cushions (see point 6.3.3 above). It would run against any logic from a technical point of view that the skilled person interpreted feature 1.3.6 as if the deformation defined (i.e. along the development axis of the collapsible tubular element) could occur as a consequence of any forces, including even those not arising from the normal use of the roadside crash cushion.

Thus, feature 1.3.6 has to be interpreted as a deformation (collapse) taking place along the development axis **during normal use** of the roadside crash cushion (i.e. a vehicle impact).

6.4.2 The tubular buffer elements (14) of D7 are arranged with their development axis in a vertical direction (see Figure 1 reproduced below). Consequently, they are

not deformed along their development axis during the normal use of the device. Thus, feature 1.3.6 is not disclosed in D7.



6.4.3 Furthermore, the reinforced apertures (50) provided with holes in the diaphragm members (24) are not regarded as "carriages" by the skilled person since they do not fit the usual technical meaning of the term (i.e. a wheeled element).

6.4.4 The Board also disagrees with the alleged disclosure of the "fixed" feature (features 1.3.7a, 1.3.7b, 1.3.8a and 1.3.8b) by the wording "mounted upon" (lines 27 to 30 of column 3). The skilled person, looking at Figure 1 of D7 when reading the description, would not understand that there is a fixation of the buffer elements (14) to the diaphragm members (24) or interior panels (22). On the contrary, in light of the whole disclosure of D7, the expression "mounted upon" must be interpreted as a mere containment of the buffer elements (24) within the space defined by the diaphragm members (24) and interior panels (22) with the assistance of the restraining cables (48). Thus, features 1.3.7a, 1.3.7b, 1.3.8a and 1.3.8b are not disclosed in D7.

6.5 D3, D4 and D5

6.5.1 The appellant did not put forward any new arguments against the novelty of claim 1 over D3, D4 or D5. Thus, the Board maintains the opinion expressed in its communication under Article 15(1) RPBA 2020.

6.5.2 The appellant did not explain where the features of claim 1 can be found in D3.

The Board agrees with the respondent in that at least the following features cannot be identified in D3:

- The "sliding supports" comprising a "fixing plate" (rib 38) do not comprise a carriage as in features 1.2.3, 1.2.4 and 1.2.5 but directly engage the rail (20) thanks to a correspondingly shaped recess (34).
- No connecting plates (feature 1.5) in substitution of a certain corresponding number of sliding supports of the plurality of sliding supports can be found in D3 (feature 1.5.1). (Note: ribs 38 are slidably connected to rail 20 and thus are fixing plates of sliding supports rather than connecting plates.)
- Consequently, the related features 1.5.2 to 1.3.8b are missing as well.
- In view of the interpretation of the feature "along the development axis of the collapsible tubular element" explained above (see point 6.4.1), feature 1.3.6 is also not disclosed in D3 (see Figure 1).

6.5.3 The appellant did not put forward any argument for objections of lack of novelty based on D4 or D5 in spite of the heading of point 14.6 of the statement setting out the grounds of appeal.

Thus, no such objection has been substantiated based on these documents, and the Board has not taken them into consideration.

6.6 D9

6.6.1 The appellant argued that the only requirements of a "fixing plate" within the meaning of claim 1 were that the fixing plate was connected to a carriage (feature 1.2.4) and that it was connected to an end of the tubular element (features 1.3.7 and 1.3.8). Since the "structural frames" disclosed in paragraphs [0031] and [0032] of D9 fulfilled these conditions, they represented such fixing plates.

This is not persuasive in view of the common technical understanding of the "plate" feature.

The Board agrees with the respondent that a fixing **plate** is a type of structural **frame**. Thus, the general disclosure of a frame (or the specific disclosure of "angle irons", see [0031] of D9) cannot take away the novelty of the particular case of a plate. Thus, feature 1.2.2 (fixing plate) and its related features 1.2.4 (carriage connected to the fixing plate) and 1.3.7a/1.3.8a (tubular elements connected to the fixing plate) are not disclosed in D9.

6.6.2 The appellant also argued that the tubular elements of D9 not supported by support posts were connected to other tubular elements at their ends, thus forming connecting plates.

This is not persuasive either.

Firstly, paragraphs [0031] and [0032] do not disclose in a clear and unambiguous manner an embodiment in which some energy-absorbing devices (310) are supported by support posts (312), whereas some other energy-absorbing devices are connected end-to-end without such support posts. They instead disclose one possibility (all devices connected by support posts) **or** the other (all devices connected end-to-end without any support post).

Secondly, the same considerations on the absence of a distinguishable connecting plate within the meaning of claim 1 as in point 6.1.1 above apply *mutatis mutandis*. Even if holes for receiving some kind of connecting means are disclosed in Figure 2, no **plate** is disclosed in this figure. The holes could also be envisaged for fixing the energy-absorbing device (200) to the undefined frames mentioned above, the disclosed angle irons or even another energy-absorbing device.

Finally, Figure 3A discloses an end plate (without a reference number) on the left side of the roadside crash cushion, but it does not disclose that this plate forms part of the sliding support, let alone that other plates form part of the subsequent sliding supports comprising support posts (312). The description does not explain the role of this end plate.

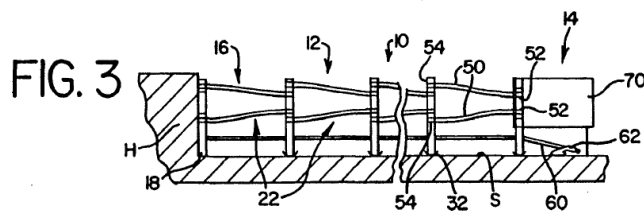
6.7 In view of the above, the subject-matter of claim 1 is novel over the cited prior art (Article 54(2) EPC).

7. Inventive step - Article 56 EPC

7.1 D6 as the closest prior art

Even if the objective technical problem defined by the appellant were accepted (how to modify D6 such that the road crash cushion could not be reused), and even if the skilled person were to resort to D8 - concerning a roadside crash cushion based on a completely different working principle - when looking for a solution to this problem, the skilled person would still not arrive at the claimed invention.

The only teaching of D8 relevant to the proposed technical problem is that "*in applications where reusability is not required it may be preferable to substitute deformable sheets such as metal sheets for the elastomeric sheets shown*" (column 4, lines 55 to 58). Thus, the skilled person understands that for a device like the one of D8, based on providing elastomeric sheets in a substantially horizontal direction (see Figure 3 reproduced below), the elastomeric sheets (50) can be replaced by metal sheets.



D8 does not disclose which other elements could replace the waste tyres (101) of D6 and, at most, the skilled person could potentially think of replacing the waste tyres (101) with elastomeric sheets arranged as in D8 when consulting this document since this is the only working solution disclosed.

A hypothetical replacement of the waste tyres (101) with some undefined metal element resembling a tyre or

forming a tubular element is pure speculation tainted by an ex post facto analysis of the prior art.

7.2 D7 as the closest prior art

The arguments of the appellant - presented only in writing - are based, on the one hand, on an interpretation of features 1.3.6 and 1.5.3 which is not convincing (see points 6.4.1 and 6.4.2 above) and, on the other hand, on a reasoning about the obviousness of the "fixed" feature which is tainted by an ex post facto analysis. In fact, no objective technical problem has been defined for this last distinguishing feature by the appellant, let alone a reasoning why the skilled person would consider it obvious to solve the posed problem by the claimed means.

7.3 D9 as the closest prior art

7.3.1 The appellant did not provide during the oral proceedings any further reasoning as to how the skilled person would arrive at the "plates" distinguishing feature. The appellant actually based its line of attack starting from D9 on the alleged fact that this document disclosed fixing plates. As this is not the case (see point 6.6.1 above), the attack must fail for this reason alone since even if the reasoning of the appellant about how the skilled person would reduce the number of parts were accepted, all features related to the presence of plates would still be missing from the resulting device (features 1.2.2, 1.2.4, 1.5, 1.3.7a, 1.3.7b, 1.3.8a and 1.3.8b).

For the sake of completeness, even if - as alleged by the appellant - the invention did not solve the objective technical problem and was only associated

with a "foreseeable worsening", this would not imply that the subject-matter was not inventive. It would instead mean that a less ambitious problem had to be formulated. In this case, even if the problem were to be formulated as developing an alternative cushion, it cannot be considered obvious - without knowledge of the current invention - to simply dispense with, or "cut", structural important elements like the posts of the D9 embodiments.

- 7.3.2 The reasoning provided in the written submissions about the obviousness of the "plates" feature is not persuasive either. This was already explained in the communication of the Board under Article 15(1) RPBA 2020.

The appellant argued that the patent did not disclose any technical effect of the fixing plates. Thus, the objective technical problem was to find an alternative for connecting the tubular elements (310) to the supporting elements (312).

However, a plate has the inherent technical effect of providing a more regular load distribution and a higher resistance to deformation. Thus, the objective technical problem for the "fixing plates" feature would be to improve the robustness of the connection between tubular elements (310) and supporting elements (312).

None of the prior-art documents discloses the advantage of using fixing plates in a device like the one of D9, i.e. where the tubular elements are **rigidly fixed** to the supporting elements. D3, D7 and D10 concern roadside crash cushions in which the tubular elements are not connected in the same way to any plate. D1 and D6 appear to disclose similar fixing plates but do not

disclose any advantage in using these. In the absence of any citation of D4, D5, D8, D12, D13 or D16 by the appellant, the combinations proposed in the statement setting out the grounds of appeal are not sufficiently substantiated.

The appellant argued as well that D9 itself hinted at how to implement the "connecting plates" feature since it disclosed that tubular elements might be connected to each other.

This argument cannot succeed.

Even if the skilled person had any incentive to bolt the tubular elements of D9 to each other as proposed by the appellant, this would not result in "connecting plates" within the meaning of claim 1 (see point 6.6.1 above).

7.4 Combination of D10, D12 or D13 with any of D2 or D14

7.4.1 The appellant did not add anything to the arguments provided in written form. Consequently, the Board maintains its opinion expressed in the communication under Article 15(1) RPBA 2020.

7.4.2 Concerning D10, the appellant argued that the irreversible plastic compression deformation could not represent a difference since this was not a limitation of claim 1.

This is not persuasive.

Feature 1.3.6 defines an irreversible compressive deformation of the collapsible tubular element which determines its collapse along its development axis.

This is an irreversible plastic compression deformation, and therefore claim 1 is limited by this deformation.

D10 does not disclose in a clear and unambiguous manner an irreversible plastic compression deformation leading to a collapse as required by feature 1.3.6. The appellant agrees (see statement setting out the grounds of appeal, page 22) that the energy cells (36, 37, 38) are powdered upon impact (see column 3, lines 62 to 66 and column 4, lines 29 to 31) and that the container (34) - made of plywood panels according to column 3, lines 20 to 22 - is shattered (see column 4, lines 3 to 6). Although irreversible, none of this corresponds to the deformation defined in feature 1.3.6.

Thus, the invention of claim 1 differs from D10 (at least) in features 1.3.6/1.5.3 (irreversible plastic compression deformation). Since the appellant has not provided any arguments about how the skilled person would arrive at these features starting from D10, the objection fails for this reason alone.

Furthermore, neither D2 nor D14 discloses the advantage of using a guide rail as in feature 1.2.1, which is a further distinguishing feature for which the appellant considered the technical problem of "improving axial incurring of an axial force and preventing displacement of the crash cushion".

- 7.4.3 The appellant did not provide any substantiation for the inventive-step objections starting from D12 or D13 in the statement setting out the grounds of appeal. These objections are therefore disregarded.

7.5 In view of the above, the subject-matter of claim 1 involves an inventive step over the proposed combinations.

8. Conclusion

As none of the objections raised prejudices the maintenance of the European patent, the Board sees no reason to revise the decision of the Opposition Division to reject the opposition (Article 101(2) EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



C. Spira

C. Herberhold

Decision electronically authenticated