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**Datasheet for the decision
of 7 February 2022**

Case Number: T 0070/19 - 3.2.03

Application Number: 09713973.7

Publication Number: 2260247

IPC: F24J2/04

Language of the proceedings: EN

Title of invention:

LAYERED CONSTRUCTION WITH TUBE SYSTEM

Patent Proprietor:

M=ECO² CVBA

Opponent:

HENCO Industries NV

Headword:

Relevant legal provisions:

EPC Art. 100(c), 123(2), 56
RPBA Art. 12(4)

Keyword:

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

Amendments - allowable (yes) - extension beyond the content of the application as filed (no)

Inventive step - (yes) - ex post facto analysis - problem and solution approach - closest prior art - reformulation of the technical problem - auxiliary request (yes)

Late-filed facts - admitted (no)

Decisions cited:

G 0003/14, T 1019/99



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Case Number: T 0070/19 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 7 February 2022

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
9 November 2018 concerning maintenance of the
European Patent No. 2260247 in amended form.**

Composition of the Board:

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

Summary of Facts and Submissions

I. European patent No. 2 260 247 B1 relates according to its title to a "layered construction with tube system".

II. The appeal lies from the decision of the opposition division to maintain the patent in amended form according to auxiliary request III. The opposition division considered that the patent as granted and auxiliary requests I and II contained subject-matter which extended beyond the original disclosure in an unallowable manner.

The opponent and the patent proprietor appealed this decision. For the sake of simplicity both appellants will be referred to in the following text as the opponent and the patent proprietor.

III. With its letter of 3 January 2022 the patent proprietor announced that it would not be attending the oral proceedings.

IV. Oral proceedings were held in the absence of the patent proprietor on 7 February 2022.

V. Requests

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

As clarified by letter dated 3 February 2022, the patent proprietor requested that the decision under appeal be set aside and that the patent be maintained as granted, or that the patent be maintained on the basis of auxiliary request I or II, filed on

1 August 2018, or on the basis of auxiliary request III as attached to the contested decision.

VI. Claim 1 as granted (main request), including the numbering of its features, reads as follows (amendments with respect to originally filed claim 1 are marked in bold):

- a1 Device for collecting and utilizing energy generated by the sun,
- a2 **suitable for a roof-covering,**
- b1 comprising a layered construction provided with a substrate layer **(4,5)** and a cover layer **(9)** comprising a curable mortar,
- c wherein there is arranged on the substrate layer a tube system **(7)** through which a fluid can be transported in order to regulate the temperature in the tube system,
- d this tube system being at least partially embedded in the mortar;
- e wherein the mortar of the cover layer **(9)** comprises cement, water and additives;
- f0 **wherein the substrate layer comprises thermally insulating elements (5) which are embedded at least partially in a mortar (4);**
- g characterized in that the mortar of the cover layer (9) further comprises insulating granules;
- h1 **in that the tube system (7) is arranged on a surface of the substrate layer (4,5) without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer;**
- i1 **and in that the thermally insulating elements are placed at a mutual distance from each other,**

j1 and the space between the thermally insulating elements is filled by means of the mortar.

Claim 12 as granted, including numbering of its features, reads as follows (amendments with respect to originally filed claim 21 are marked in bold):

- a1' Method for manufacturing a layered construction for a device for collecting and utilizing energy generated by the sun,
- a2' **suitable for a roof-covering,**
- b1' comprising of arranging a cover layer (9) on a substrate layer (4,5), the cover layer (9) comprising a curable mortar,
- c' wherein a tube system (7) through which a fluid can be transported is arranged on the substrate layer,
- d' this tube system (7) being at least partially embedded in the mortar;
- e' wherein the mortar of the cover layer (9) comprises ~~insulating granules~~, cement, water and additives;
- f1' **wherein the substrate layer is formed by arranging liquid curable mortar (4) and placing thereon elements (5) of insulation material**
- f2' **preformed into blocks,**
- g' characterized in that the mortar of the cover layer (9) further comprises insulating granules;
- h1' **in that the tube system (7) is arranged on a surface of the substrate layer (4,5) without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer;**
- i' **and in that the blocks are placed at a mutual distance,**

j' and the space between the blocks is filled by means of the mortar.

VII. Claim 1 of auxiliary request I is based on claim 1 of the main request, with the following amendments in features f0 (now f1), i1 (now i11) and j1 (now j11) (amendments in bold):

f1 wherein the substrate layer comprises thermally insulating elements (5) which are embedded at least partially in a mortar (4) **and which are preformed into blocks**

i11 and in that the ~~thermally insulating elements~~ **blocks** are placed at a mutual distance from each other,

j11 and the space between the ~~thermally insulating elements~~ **blocks** is filled by means of the mortar.

Independent claim 12 of auxiliary request I is identical to claim 12 of the main request.

VIII. Claim 1 of auxiliary request II is based on claim 1 of the main request with a new feature f2 (see below) inserted after feature f0, and with the same amendments concerning features i1 (now i11) and j1 (now j11) as in auxiliary request I.

f2 wherein the substrate layer is formed by **arranging liquid curable mortar (4) and placing thereon the thermally insulating elements (5) preformed into blocks**

Independent claim 12 of auxiliary request II is identical to claim 12 of the main request.

IX. Claim 1 of auxiliary request III (i.e. the version of the patent as maintained by the opposition division) comprises the same amendments as auxiliary request II, supplemented by the following amendments in features b1 (now b3), f2 (now f3) and h1 (now h3) (amendments in bold):

- b3** comprising a layered construction provided with a substrate layer (4,5) and a cover layer (9) comprising a curable mortar, **said substrate layer (4,5) having a substantially flat upper surface**
- f3** wherein the substrate layer is formed by arranging liquid curable mortar (4) and placing thereon the thermally insulating elements (5) preformed into blocks **of insulation material**
- h3** in that the tube system (7) is arranged on **a the upper** surface of the substrate layer (4,5) without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer;

Independent claim 12 of auxiliary request III is identical to claim 12 of the main request, with the following amendments in features b1' (now b3') and h1' (now h3') (amendments in bold):

- b3'** comprising of arranging a cover layer (9) on a substrate layer (4,5), **said substrate layer (4,5) having a substantially flat upper surface**, the cover layer (9) comprising a curable mortar
- h3'** in that the tube system (7) is arranged on **a the upper** surface of the substrate layer (4,5) without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer;

X. State of the art

The following documents were cited both in the grounds of appeal and during the opposition proceedings and are relevant to the present decision:

A17: US 4,120,131 A
D7: US 4,548,007 A
D10: DE 296 20 230 U1

XI. The opponent's arguments can be summarised as set out below.

Main request and auxiliary requests I and II -
Extension of subject-matter

Features h1/h1' (the tube system is arranged on a surface of the substrate layer without sinking) were originally disclosed only in combination with a "flat upper surface". The omission of the latter feature in claims 1 and 12 constituted an unallowable intermediate generalisation.

Furthermore, the feature "thermally insulating elements" in features f0, i1 and j1 was originally disclosed only in combination with the feature "elements of insulation material". Thus, the omission of the latter feature in claim 1 constituted an unallowable intermediate generalisation as well.

Auxiliary request III - Extension of subject-matter

Features i11/i' (blocks at a mutual distance) and j11/j' (space between the blocks filled by means of the mortar) were disclosed in the passage on page 8, line

37, to page 9, line 6, of the application as filed (in the present decision, references to the application as filed are references to the PCT A2 publication). However, they were disclosed there only in combination with the disclosure on page 9, lines 7 to 15, where a grid and a particular order for arranging the claimed elements were disclosed. Since features i11/i' and j11/j' were included in isolation from, i.e. separately from, the grid and from this particular order of construction, the subject-matter of claims 1 and 12 constituted an unallowable intermediate generalisation. This was particularly evident for method claim 12, since the embodiment on page 8, line 37, to page 9, line 15, constituted the only disclosure of a method for manufacturing a layered construction in the originally filed patent application. In contrast with this disclosure, method claim 12 encompassed methods wherein the tube system had been arranged on the substrate layer before filling the space between the blocks with mortar, or wherein the tube system had been arranged after the mortar of the cover layer. Such manufacturing methods were, however, not originally disclosed.

Furthermore, the feature "mortar" in b3/b3' (cover layer comprising a curable mortar), e/e' (the mortar of the cover layer comprises cement, water and additives), g/g' (the mortar of the cover layer further comprises insulating granules), f3/f1' (the substrate layer is formed by arranging liquid curable mortar) and j11/j' (space between the blocks filled by means of the mortar) could be interpreted to mean that the same mortar was used both in the cover layer and also for filling the space between the blocks. However, the original disclosure on page 8, line 37, to page 9, line 15, - which concerned the specific embodiment included

in the claims, with the tube system being arranged without sinking into the substrate layer - only indicated the use of different mortars for the cover layer and for filling the space between the blocks. The sentence bridging pages 6 and 7 merely disclosed a "similar" composition, but not the same composition. It did not concern the claimed embodiment either.

Feature b3, b3' (a substantially flat upper surface) in claims 1 and 12 was not originally disclosed in combination with features f3 (substrate layer formed by arranging liquid curable mortar and placing thereon the thermally insulating elements preformed into blocks of insulation material), i11 (blocks at a mutual distance), j11 (space between the blocks filled by means of the mortar) and h3' (the tube system is arranged on the upper surface of the substrate layer without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer).

Furthermore, feature h3/h3' (the tube system is arranged on the upper surface of the substrate layer without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer) in claims 1 and 12 was not originally disclosed in combination with the features i11/i' (blocks at a mutual distance) and j11/j' (space between the blocks filled by means of the mortar).

Auxiliary request III - Inventive step

The device of claim 1 combined roof covering and heat collection. The skilled person would have started from document A17 as the "closest prior art". This document disclosed a roof covering device (Figure 3) as well as a device for the collection of solar heat (Figure 6).

The only two differences between claim 1 and the embodiment of Figure 3 in A17 were the arrangement (and thus the presence) of a tube system (features c, d, h3) and the placement of the blocks of insulation material on the liquid curable mortar (feature f3). The technical effect of the tube system was that solar energy was collected from the roof. The presence of mortar below the blocks represented just an alternative (as exemplified by D7) to the adhesives used in A17 to connect the block ("insulation being synthetic organic polymeric foam") and the "formboard (42)" below it. Thus, the objective technical problem associated with the tube system was providing a system for collecting solar energy which was suitable for the device of Figure 3. The skilled person would have found a hint to consider this problem in A17 itself, which already comprised an embodiment for collecting solar energy (Figure 9).

Faced with this technical problem, the skilled person would have consulted D10, which dealt with collecting solar energy from a large concrete surface, thereby implementing a tube system as in the claimed device.

XII. The patent proprietor's arguments can be summarised as set out below.

Main request, auxiliary requests I and II

The passage on page 2, lines 19 to 26, of the application as filed provided a basis for features h1 and h1' in isolation from the feature "flat upper surface". Indeed, the latter features were disclosed as a separate option from the features concerned. More particularly, the feature "flat upper surface" involved

a particular advantage (simplifying or enabling the arranging of tubes), which the skilled reader interpreted as the reason for this separate option. The arrangement according to features h1 and h1' was thus understood by the skilled reader as a further simplification of the arrangement of the tubes, regardless of whether the upper surface was flat or not.

The originally filed application disclosed information making the skilled reader understand that thermally insulating elements needed to have insulating properties, and that the terms "thermally insulating materials" and "elements of insulating material" were used interchangeably throughout the application as filed (see page 2, lines 10 to 18, and page 5, line 36, to page 6, line 9).

Auxiliary request III - Extension of subject-matter

A basis for features i11/i' and j11/j' was to be found on page 9, lines 1 to 6, and in claim 27 as originally filed. The skilled reader derived from the application as a whole that the features concerned were not related to the grid. Indeed, the grid was mentioned independently of these features in claims 25 and 26 and also in the passage from page 2, line 34, to page 3, line 11.

As regards the mortars, when features f3/f1'/f2' and j11/j' were read in the context of the claim as a whole it was clear that the mortar filling the spaces between the blocks was the mortar of the substrate layer, since the substrate layer comprised the blocks of insulation material. The cover layer was not part of the substrate

layer and thus the mortar in the cover layer could not have been used to fill the spaces between the blocks.

Auxiliary request III - Inventive step

The embodiment disclosed in Figure 3 of A17 did not relate to a similar purpose to claim 1. This embodiment concerned the integration of both a metal structure and an insulation material into a wall or roof without any indication of collecting and utilising energy generated by the sun. The skilled person would more likely have looked at the embodiment of Figure 9 of A17 as the "closest prior art". Indeed, this embodiment concerned a solar energy-absorbing roof deck and was therefore directed to a similar purpose to the invention.

The reasoning according to which the skilled person would allegedly have combined the embodiment of Figure 3 of A17 with D10 was based on an *ex-post facto* analysis. There was no motivation in A17 to transform the embodiment of Figure 3 into a device for collecting and utilising energy generated by the sun. Indeed, the skilled person would have found a compatible solution for collecting solar energy in the embodiment of Figure 9 of A17 and thus would not have had any incentive to adapt the embodiment of Figure 3 by adding features from D10. The proposed combination was carried out with hindsight and consequently was not permissible.

Reasons for the Decision

1. Rule 115(2) EPC and Article 15(3) RPBA 2020

The patent proprietor was duly summoned to the oral proceedings on 4 March 2021. It informed the Board on 3 January 2022 that it would not be attending the oral proceedings.

The Board thus continued the proceedings in the absence of the patent proprietor, which was treated as relying only on its written case (Rule 115(2) EPC, Article 15(3) RPBA 2020).

2. Main request - Extension of subject-matter

2.1 Features h1 and h1' - Omission of "substantially flat upper surface"

Features h1 and h1' - added to claims 1 and 21 as originally filed - read:

"the tube system (7) is arranged on a surface of the substrate layer (4,5) without sinking into this substrate layer or without sinking in predefined recesses in the substrate layer."

The patent proprietor's arguments concerning the alleged disclosure of these features as separate from the feature "substantially flat upper surface" are not persuasive. The reasons are set out below.

The originally filed application discloses on page 2, line 19, that the substantially flat upper surface forms part of "preferred embodiments" of the invention. The next sentence discloses the advantage of the

feature, i.e. simplifying or enabling the arranging of tubes, tube system and cover layer. Immediately thereafter it is disclosed that "*the tube system can preferably be arranged on the upper surface of the substrate layer without sinking into this substrate layer...*". This is the **only disclosure of features h1 and h1'**. The term "the upper surface" in this last sentence can only refer to the previously defined upper surface, i.e. the "substantially flat upper surface" at the beginning of the passage. The word "preferably" in the sentence on page 2, line 23, refers to the action of arranging the tube system on the substantially flat upper surface, i.e. at this particular location or elsewhere. It does not, however, define an alternative with regard to the configuration of the upper surface of the substrate layer, which was defined as "substantially flat" immediately above in the same paragraph. Furthermore, as this is said to simplify or enable the arrangement, it is functionally linked with the arrangement of the tubes.

Consequently, the incorporation of features h1 and h1', in isolation from the feature "substantially flat upper surface" originally disclosed therewith, into claims 1 and 12 results in an unallowable intermediate generalisation.

2.2 At least for the reasons given in point 2.1 above, the ground for opposition according to Article 100(c) EPC prejudices the maintenance of the patent as granted (main request).

3. Auxiliary requests I, II - Extension of subject-matter

Since the "substantially flat upper surface" is also missing in auxiliary requests I and II containing

features h1/h1', the same considerations and conclusion as in the preceding point apply here.

4. Auxiliary request III (maintained version)

4.1 Extension of subject-matter

4.1.1 The "substantially flat upper surface" has been added to the subject-matter of claims 1 and 12 (features b3, h3 and b3', h3'). The objection regarding the extension of subject-matter discussed in points 2.1 and 3 above is thus overcome.

Moreover, claim 1 of auxiliary request III defines the thermally insulating elements to be preformed into blocks, the blocks being placed at a mutual distance from each other and the space between the blocks being filled by means of the mortar (features f1, i11, j11). The objection of an alleged unallowable intermediate generalisation regarding the omission of the feature "elements of insulation material" is thereby rendered irrelevant.

4.1.2 Features i11/i' and j11/j' - Alleged unallowable omission of the "grid"

The basis for features i11/i' (blocks at a mutual distance) and j11/j' (space between the blocks filled by means of the mortar) is to be found on page 8, line 37, and page 9, line 6, of the application as filed. This passage concerns "a preferred method" (see page 8, line 37) and discloses a particular embodiment for manufacturing the substrate layer.

Even though the passage referred to by the opponent (page 9, lines 7 to 15) immediately follows the "preferred method" mentioned above, this passage is part of a separate paragraph which discloses an (even further) "preferred method" (see page 9, line 7), and thus a further restricted particular embodiment. This separate embodiment discloses the use of a grid and a particular way of arranging the grid, the tube system and the mortar of the cover layer. No link between the preferred embodiment of the preceding paragraph and this preferred, yet separate and more restricted embodiment is disclosed in this passage.

In fact, arranging a substrate layer on a suitable ground surface, arranging a tube system and arranging a cover layer are disclosed in general (i.e. without the grid) on page 8, lines 31 to 37, of the application as filed. This is in accordance with the originally disclosed claims, in which the grid is only defined in dependent claims 12 and 13 (the step of arranging such a grid being defined in dependent method claims 25 and 26). According to the original claim structure, the grid is thus not necessarily present in combination with the tube system (which is defined in independent device claim 1 and independent method claim 21 as filed) or with the insulating elements being preformed into blocks (see dependent method claim 27).

The disclosure on page 9 as well as the originally filed claim tree, both revealing the use of a grid as a preferred option, thus provide a basis for features i11/i' and j11/j' without at the same time defining the grid.

4.1.3 Features i' and j' - Alleged unallowable omission of the order of steps

Originally filed method claims 21-27 did not define any order of steps for manufacturing the layered construction. Independent claim 21 merely listed some steps which were encompassed by the method, and which are included in features a1' (method for manufacturing a layered construction), b3' (arranging a cover layer comprising a curable mortar on a substrate layer), c' (arranging a tube system on the substrate layer), d' (tube system at least partially embedded in the mortar) and e' (the mortar of the cover layer comprising cement, water and additives) of claim 12 of auxiliary request III.

Originally filed claim 27, dependent on claim 21, defined further steps, which are included in further features of claim 12 of auxiliary request III, namely f1' (substrate layer is formed by arranging liquid curable mortar and placing thereon elements of insulation material), f2' (blocks), i' (blocks at a mutual distance) and j' (the space between the blocks is filled by means of the mortar). Originally filed claim 27 likewise did not define any order of steps concerning the arrangement of the tube system and the mortar of the cover layer.

The originally disclosed claims thus encompassed - in the same way as the claims of current auxiliary request III - embodiments wherein the tube system could be arranged before filling the space between the blocks, or after arranging the mortar of the cover layer. Consequently, there is no extension of subject-matter in this respect.

The opponent has not identified any difference in claim 12 of auxiliary request III with regard to originally filed claims 21 and 27 which could justify why the skilled person did not regard the above-mentioned embodiments as implemented in the invention of claim 12. The Board likewise does not see why this should be the case. Indeed, the skilled reader would understand that the added wording "substantially flat upper surface" in feature b3', added feature g' (the mortar of the cover layer further comprises insulating granules) and added feature h3' (tube system is arranged on the upper surface of the substrate layer without sinking) are not disclosed as having an effect on the order of steps concerning the arrangement of the tube system and the mortar of the cover layer. Moreover, the disclosure in lines 9 to 15 of page 9 as originally filed is a "preferred method", which is not linked to these added features. Instead, it merely concerns a preferred embodiment for manufacturing a covered layer consisting of a substrate layer, a tube system and a cover layer comprising curable mortar of an unspecified composition.

Thus, the lack of definition of the order of the method steps in claim 12 concerning arranging the tube system, the substrate layer and the cover layer does not result in an unallowable intermediate generalisation.

4.1.4 Feature "mortar" in b3/b3', e/e', g/g', f3/f1' and j11/j'

The Board agrees with the patent proprietor that the claim wording itself defines what the mortar of the cover layer and the mortar of the substrate layer are. By definition, the mortar contained in the cover layer (features b3/b3', e/e', g/g') corresponds to a "mortar

of the cover layer", whereas the mortar contained in the substrate layer (features f3/f1', j11/j') corresponds to a "mortar of the substrate layer".

This was originally disclosed in claims 1, 7 and 8 as filed concerning the device and in claims 21 and 27 concerning the method.

As discussed during the oral proceedings, the fact that features j11/j' include the wording "**the** mortar" - without specifying explicitly to which mortar these features refer - could be seen as a lack of clarity. However, this was present in claims 1 and 12 as granted (features j1 and j') and thus cannot be examined in opposition appeal proceedings (see G 3/14, headnote). Moreover, it does not change the fact that the mortar filling the space between the blocks is the mortar of the substrate layer by reason of its location. Also, "filling the space between the blocks by means of **the** mortar" - without specifying which mortar is referred to - is already disclosed in claim 27 as filed.

Furthermore, the originally filed claims leave the composition of the mortar of the substrate layer open. Thus, an identical composition of both mortars was already encompassed by the invention as originally claimed. The disclosure in the sentence bridging pages 6 and 7 merely corresponds to a preferred embodiment ("*... preferably has a composition similar to ...*"). The skilled reader does not conclude from this that the invention excluded mortars of identical composition. Finally, the passage extending from line 37 of page 8 to line 15 of page 9 does not specify the composition of the mortars.

Consequently, the lack of definition of the nature of the mortar of the cover layer and the mortar filling the spaces between the blocks in claims 1 and 12 does not result in an unallowable extension of subject-matter.

4.1.5 Combination of features - Article 12(4) RPBA 2007

The opponent raised new objections concerning extension of subject-matter in its reply to the patent proprietor's statement of grounds of appeal (see page 5 of the letter dated 12 July 2019). The new objections concerned the allegedly not originally disclosed combination of some features of claims 1 and 12:

combination of the feature "a substantially flat upper surface" (b3, b3') with features f3, i11 and j11 of claim 1, and with feature h3' of claim 12, respectively; and

combination of feature h3/h3' in claims 1 and 12 with the respective features i11/i' and j11/j'.

No arguments have been provided as to why these new objections were filed for the first time at this late stage of the proceedings. In addition, the statement of grounds of the patent proprietor did not contain any new fact which might have justified the late filing of the objections.

More particularly, the objections could and indeed should already have been filed during the opposition proceedings, since the opponent had ample time to assess the features concerned at that time. These features were included in the auxiliary request III filed on 1 August 2018. Furthermore, the only amendment

in auxiliary request III filed during oral proceedings was the inclusion of the feature "of insulation material" in feature f3. This was an amendment which the opponent did not raise as a cause of lack of compliance by itself.

Moreover, the arguments in support of the objections amount to a mere statement that the combination of some claimed features had not been originally disclosed. There is no further explanation of the particular circumstances surrounding the disclosure of each feature in the originally filed application and why the skilled person would not contemplate the combination thereof (see page 5 of the opponent's reply dated 12 July 2019).

Consequently, even if the objections were not held inadmissible, they would need to be disregarded on the ground of lack of substantiation. This prevents the Board from taking a position on the arguments provided.

In view of the above, the Board decides to make use of its discretion under Article 12(4) RPBA 2007 and does not admit the new objections into the proceedings.

4.1.6 Conclusion

Taking into account the considerations above, the subject-matter of auxiliary request III does not extend beyond the original disclosure in an unallowable manner (Articles 100(c) and 123(2) EPC).

4.2 Inventive step

4.2.1 Starting point - Introductory remarks

The patent proprietor contested the view that the embodiment of Figure 3 of A17 represented the "closest prior art", given its different purpose with respect to the claimed invention.

Indeed, even though the embodiment of Figure 3 of A17 concerns a poured roof deck - i.e. the same kind of roof structure as defined in claims 1 and 12 -, it is not a "*device for collecting and utilizing energy generated by the sun*" (emphasis added). In other words, it is not conceived for the same purpose or aimed at the same objective as the claimed invention. In fact, the roof deck of Figure 3 is merely intended to provide insulation and fire protection in an economic roof structure (see column 8, lines 24 to 28).

Moreover, the device disclosed in Figure 3 of A17 - in contrast with the prior art mentioned in the patent - does not comprise a tube system at all. Therefore, it does not appear to be the prior-art document having the most relevant technical features in common, i.e. requiring the fewest structural modifications, either.

Document A17 thus does not appear to be a promising springboard to the claimed invention.

This is also shown in the analysis below in 4.2.2, which nevertheless starts from A17, Figure 3, as the "closest prior art". Indeed, this constitutes the only line of attack presented by the opponent.

4.2.2 Figure 3 of A17 as the starting point

The parties agree that the embodiment disclosed in Figure 3 of A17 discloses a device comprising the following features:

- suitable for a roof-covering (see column 7, lines 3 to 6)

- comprising a layered construction provided with a substrate layer (see Figure 3 showing a formboard 42, insulations 43, and the portion of concrete 45 between insulations 43) and a cover layer (tar and roofing paper 46, tar and gravel 47, and the portion of concrete 45 above insulations 43) comprising concrete (45), said substrate layer (42, 43, part of 45) having a substantially flat upper surface

- wherein the concrete (45) of the cover layer comprises cement, water and additives (see column 7, line 59 to column 8, line 6)

- wherein the substrate layer (42, 43, part of 45) comprises thermally insulating elements (insulations 43) which are embedded at least partially in concrete (45)

- wherein the substrate layer is formed by arranging a formboard (42) and placing thereon the thermally insulating elements (43) in the form of strips of insulation material ("*synthetic polymer foam or mineral fiber insulation*")

- wherein the concrete (45) of the cover layer further comprises insulating granules (see column 7, lines 59 to 62: "*perlite*")

- wherein the strips are placed at a mutual distance from each other (see figure 3, open spaces 49 between the insulations 43, and column 7, lines 8 to 13)

- and wherein the space (49) between the strips (43) is filled by means of the concrete (45).

4.2.3 Differentiating features

Uncontestedly, the device disclosed in Figure 3 of A17 does, at least, not disclose the tube system of features c/c', d/d' and h3/h3'.

4.2.4 Technical effect and objective technical problem

The technical effect of the tube system is that the energy of the sun is collected and can be utilised.

The objective technical problem proposed by the opponent is "finding a system **for collecting [and utilising] solar energy** suitable for the device of Figure 3" (emphasis added).

This problem contains almost verbatim the pre-characterising portion of claims 1 and 12, which concerns a device "**for collecting and utilizing energy generated by the sun**" (feature a1) and a method for manufacturing a layered construction for such a device (feature a1'). The technical problem proposed by the opponent thus comprises elements of the solution, which in the assessment of inventive step, and in particular in the problem-solution approach, is to be avoided.

Thus, the proposed objective technical problem cannot be accepted, since its definition is tainted by an *ex-post facto* approach (see Case Law of the Boards of Appeal, 9th Edition, I.D.4.3.1, in particular T 1019/99, point 3.3).

For this reason alone, the inventive-step objection raised by the opponent cannot succeed.

- 4.2.5 The opponent argues that A17 itself would prompt the skilled person to consider the reformulated objective technical problem in the context of collecting solar energy. Indeed, A17 itself also disclosed a system for such a purpose (see column 10, lines 16 to 28).

However, according to the problem-solution approach, the technical difference and the objective technical problem are to be determined by a comparison of the disclosure in the closest prior art and the invention rather than by a comparison of two embodiments in the closest prior-art document. The objective technical problem then has to be formulated without elements of the solution of the invention and not by using the difference between the two embodiments of the prior-art document.

- 4.2.6 When formulating the objective technical problem on the basis of the differentiating features related to the tube system without elements of or pointers to the solution, a possible formulation could be of how to provide a new or additional functionality for the device disclosed in Figure 3 of A17.

The skilled person starting from the embodiment of Figure 3 of A17 would, however, have multiple possibilities for finding a new or additional functionality for the roof deck disclosed therein. The arguments of the opponent fail to explain why the skilled person would - without hindsight - select the particular application of solar energy collection among all the possible applications.

In view of the above, the objection raised by the opponent cannot call into question the decision of the opposition division according to which the subject-matter of claims 1 and 12 involves an inventive step.

5. Conclusion

In view of the considerations above, there is no reason to set aside the decision of the opposition division.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:



C. Spira

C. Herberhold

Decision electronically authenticated