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**Datasheet for the decision
of 28 November 2022**

Case Number: T 1787/18 - 3.2.05

Application Number: 10774179.5

Publication Number: 2386039

IPC: F16L11/22

Language of the proceedings: EN

Title of invention:

Multilayer tube for hydraulic connection and wiring of solar panels

Patent Proprietor:

Evertec Sp. z o.o.

Opponents:

Solarbayer GmbH
Torgen (Switzerland) GmbH
Hacı Ayvaz Endüstriyel Sanayi ve Ticaret A.S.

Relevant legal provisions:

RPBA Art. 12(4)
RPBA 2020 Art. 11
EPC Art. 56, 104(1), 111(1)

Keyword:

Admittance of documents E13 to E16 (yes: E13, E13', E14;
no: E15, E16)

Abuse of proceedings (no)

Apportionment of costs (not equitable)

Remittal to the department of first instance (no)

Inventive step (yes)

Decisions cited:

T 0920/20



Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1787/18 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 28 November 2022

Appellant: Torgen (Switzerland) GmbH
(Opponent 2) Kesselstrasse 2
8957 Speitenbach (CH)

Representative: Keller Schneider
Patent- und Markenanwälte AG
Eigerstrasse 2
Postfach
3000 Bern 14 (CH)

Respondent: Evertec Sp. z o.o.
(Patent Proprietor) ul. Leszno 59
06-300 Przasnysz (PL)

Representative: Magdalena Domon
Kancelaria Patentowa Igor Sawicki
Ul. Zurawia 45
00-680 Warszawa (PL)

Party as of right: Solarbayer GmbH
(Opponent 1) Am Dörrenhof 22
85131 Pollenfeld (DE)

Representative: Canzler & Bergmeier Patentanwälte
Partnerschaft mbB
Despag-Straße 6
85055 Ingolstadt (DE)

Party as of right: Haci Ayvaz Endüstriyel Sanayi ve Ticaret A.S.
(Opponent 3) Atatürk Sanayi Bölgesi
Hadimköy Mahallesi
Mustafa Inan Caddesi No. 44
Istanbul (TR)

Representative: Keller Schneider
Patent- und Markenanwälte AG

Eigerstrasse 2
Postfach
3000 Bern 14 (CH)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 7 May 2018
rejecting the oppositions filed against European
patent No. 2386039 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman P. Lanz
Members: O. Randl
 A. Bacchin

Summary of Facts and Submissions

- I. Opponent 2 filed an appeal against the opposition division's decision to reject all three oppositions against European patent No. 2 386 039 ("the patent").
- II. Among the documents cited in the decision under appeal, the following were relevant for the appeal proceedings:
- D2: Brochure Solar Birnbreier GmbH (pages 1-3)
 - D7: EP 1 707 897 A1
 - E9: US 2007/0102055 A1
 - E4': Wikipedia entry on "Aerogel" from 2008
 - E10: EP 1 213 527 A2
 - E13: Brochure "SOLAR METAL FLEX Edelstahl Wellrohre und Rohrsysteme" issued by SOLAR Kurt Birnbreier GmbH, dated 06/2008 (6 pages)
 - E13': Letter of SOLAR Kurt Birnbreier GmbH to Solarbayer GmbH, dated 13 July 2016
- III. The appellant filed the following documents with its statement of grounds of appeal:
- E14: Certified copy of brochure "SOLAR METAL FLEX Edelstahl Wellrohre und Rohrsysteme" issued by SOLAR Kurt Birnbreier GmbH, dated 06/2008 (4+1 pages)
 - E15: Certified copy of brochure "SOLAR METAL FLEX 2 IN 2" issued by SOLAR Kurt Birnbreier GmbH, dated 06/2008 (2+1 pages)
 - E16: Invoice 2009-42244 issued by SOLAR Kurt Birnbreier GmbH to suncor GmbH, dated 2 September 2009 (1 page)

IV. With its reply to the statement of grounds of appeal, the respondent filed the following documents:

- Annex 1: Internet article "*Optima pozytywnie o bi Solar Evertech*", dated 11 December 2012 and an English translation thereof
- Annex 2: Internet article "*Z Wojciechem Lenarskim - przedstawicielem firmy Evertec sp. z o.o. o innowacyjnych rozwiązaniach w instalacjach solarnych rozmawia Ewa Grochowska*", undated, and an English translation thereof
- Annex 3: Photograph of an insulator tube, undated
- Annex 4: A. Mirowski, "Comparative analysis of pipe insulation materials aerogel (AE) and EPDM", dated 17 September 2019

V. Oral proceedings before the board took place on 28 November 2022.

Although the appellant (opponent 2) and the two parties as of right (opponents 1 and 3) had been duly summoned, they were not present at the oral proceedings. The appellant and opponent 3 had announced that they would not be attending by letters dated 28 October 2022 and 10 November 2022, respectively. In accordance with Rule 115(2) EPC and Article 15(3) RPBA 2020, the proceedings were continued without the absent parties.

VI. The appellant (opponent 2) requested in writing that the decision under appeal be set aside and that the European patent be revoked. The appellant also requested that, if necessary, the case be remitted to the opposition division for further prosecution.

The respondent (patent proprietor) requested that the appeal be dismissed, or that the decision under appeal

be set aside and that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 5 filed with the respondent's reply to the statement of grounds of appeal dated 16 January 2019. The respondent also requested an apportionment of costs in view of an alleged abuse of procedure on behalf of the appellant.

The parties as of right (opponents 1 and 3) did not file any submissions during the appeal proceedings.

VII. Claim 1 of the patent as granted (main request) reads as follows (the feature references used by the board are given in square brackets):

"1. [1] A multilayer tube (10) for the hydraulic connection and wiring of solar panels, comprising

- [2] at least two tubes (11, 12), one for delivery and one for return, for a heat transfer fluid designed to circulate in at least one solar panel (13) with which the multilayer tube is associated, [3] said tubes being extended along parallel paths,
- [4a] at least one thermal insulation layer (14), [4b] arranged so as to wrap around each tube (11, 12),
- [5] a protection and containment sheath (15), which is arranged so as to surround all of said tubes (11, 12) with said insulating layer (14), [6] said sheath being contoured so as to form a longitudinal containment channel (16) for at least one electrical wiring cable (17),

the multilayer tube (10) being characterized in that

- [7] said insulation layer (14) is made of Aerogel, and

- [8] said sheath (15) is contoured so as to form two lateral mutually separate tubular channels (19, 20), one for each one of the tubes (11, 12) wrapped in said Aerogel insulating layer (14)."

VIII. The relevant submissions of the parties can be summarised as follows:

(a) Admittance of documents E13 and E13'

- (i) Appellant (opponent 2)

Documents E13 and E13' were both filed by letter dated 1 December 2017, prior to the oral proceedings in the opposition proceedings. Being *prima facie* relevant, they should have been admitted into the opposition proceedings. They concern a product based on the product described in prospectus D2. The fact that this product was publicly available before the priority date of the patent (28 October 2009) was confirmed in section 5.1.4 of the decision under appeal. Contrary to the finding of the opposition division, document D2 discloses feature 6. Document E13 shows this feature even more clearly and also unambiguously discloses feature 8. Thus, E13 is even more relevant than document D2. The filing of documents E14 and E15 was intended to overcome the opposition division's objection that the original prospectus for E13 was not available. Document E13 bears the indication "06/2008", showing that it was printed in June 2008. It can be safely assumed that document E13 was made available to the public before the priority date of 28 October 2009. This is also confirmed by document E13'.

(ii) Respondent (patent proprietor)

Documents E13 and E13' were late filed by opponent 1, without justification, during the opposition proceedings. The appellant did not show any interest in these documents during the opposition proceedings. By referring to these documents at the appeal stage, it is aiming at prolonging the proceedings, which constitutes an abuse of procedure. The opposition division's discretionary power not to admit late-filed facts and evidence into the proceedings pursuant to Article 114(2) EPC should not be questioned in the appeal unless it was not exercised correctly. As the appellant did not mention any procedural mistake on the part of the opposition division, the latter's decision should not be questioned. In accordance with Article 12(4) RPBA 2007, the board has the power to hold inadmissible facts, evidence or requests which could have been presented or which were not admitted in the proceedings before the department of first instance. Moreover, documents E13 and E13' are not highly relevant. Document E13 does not have any added value with respect to the documents already on file. Moreover, the allegation that it was publicly available before the priority date is doubtful. If it had been publicly accessible, it had therefore also been available to the opponents long before the filing thereof in the proceedings. The appellant did not provide any reasons why document E13' should be introduced into the proceedings. The opponent which initially tried to introduce it into the proceedings did not file an appeal. Thus, this document should be disregarded. The statement it contains was not given under oath and its authenticity was never confirmed. Its probative value is at least questionable because (1) the first line of the statement suggests that it

was ordered, (2) the prospectuses it relates to are not attached to it, (3) it cannot be established whether and what products were distributed/available to the public and whether there was an implicit secrecy agreement, and (4) considering the reference "01/2006" it is surprising that the company waited until March 2009 to distribute these documents. Thus, the reference "01/2006" cannot be considered to be the date the catalogue was made available to the public. It is possible that the catalogue was printed for internal use and was not publicly available. Moreover, there are considerable technical differences between the subject-matter of claim 1 and the disclosure of document E13: the insulator type is different (EPDM vs. aerogel), the insulation is fixed differently (pipe-in-pipe vs. wrapping) and protected differently (PE foil vs. sheath), the bridge between the tubes is different (very small for document E13), and the wiring cables are placed differently. Consequently, document E13 is not highly relevant.

(b) Admittance of documents E14 to E16

(i) Appellant (opponent 2)

Documents E14 to E16 were filed to prove that document E13 was highly relevant. Since the newly introduced document E14 is merely the original of prospectus E13, its introduction is justified. Two missing pages in document E14 as compared to document E13 are explained simply by a lost double-printed insert page. Document E15 is a somewhat more compact double-sided prospectus on the product "Solar Metal Flex 2in2 ECO", which is already known from the opposition proceedings before the department of first instance, and should therefore be admitted into the appeal proceedings. Document E16

establishes a sale made on 2 September 2009 of SOLAR-Flexrohr 2in2 ECO in various dimensions by SOLAR Kurt Birnbreier GmbH to suncor GmbH in Stuttgart. It constitutes evidence that the product was made available to the public and therefore should also be admitted into the appeal proceedings.

(ii) Respondent (patent proprietor)

Documents E14 to E16 should not be admitted into the proceedings because (1) they were filed unjustifiably late, (2) the opponent did not set out the circumstances that prevented it from filing the documents earlier; (3) the documents are not relevant since they do not disclose tubes similar to those of claim 1 of the patent, and (4) their reliability is at least questionable. Documents E14 and E15 cannot be considered to be copies of original document E13. Document E14 differs from document E13 because it does not contain two pages which were present in document E13. Document E15 was not present in document E13, and document E16 is not related to documents E14 or E15. It cannot even be established which documents were printed in 2008 and what was disclosed to whom and when. It is possible that these documents were internal drafts or were shown under a secrecy agreement. It has not been proven that documents E14 and E15 were publicly available before the filing date of the patent. The catalogue may have been printed at any time. There are no statements under oath establishing that the catalogue was printed in 2008, and that it was made publicly available at that time. Document E16 should not be admitted into the proceedings since the date of its disclosure is at least questionable.

(c) Abuse of procedure

(i) Respondent (patent proprietor)

The actions taken by opponent 2 during the opposition proceedings and appeal proceedings constitute a clear abuse of procedure. They seem to purposely lead to the prolongation of the proceedings and are unfair to the patent proprietor. Throughout the proceedings, opponent 2 [now the appellant] kept changing its grounds for opposition, the facts it invoked and the documents/evidence it was using as a basis for its submissions. Furthermore, during the oral proceedings before the opposition division it tried to introduce new documents, without giving any reason for doing so, and it then based the appeal on documents it had not previously filed and had ignored during the opposition proceedings. This way of proceeding is questionable. It is clear that the appellant has simply been aiming at prolonging the opposition/appeal proceedings.

(ii) Appellant (opponent 2)

The appellant did not initiate the proceedings improperly, nor did it want to drag them out. An appeal was available to the appellant under the EPC and the opportunity, for example, for clarifying arguments and also for requesting the introduction of additional documents is also possible according to EPO case law. There can be no question of tactical abuse by filing an appeal. The appellant complied with all time limits and is of course interested in expeditious proceedings. The appellant did not collect documents in order to introduce them into the appeal proceedings only belatedly and in an abusive manner. It is permissible

for documents and arguments to be used or adapted differently during an appeal and the oral proceedings.

**(d) Lack of inventive step of claim 1 as granted,
starting from document E13/E14**

(i) Appellant (opponent 2)

Document E13 can be considered to be the closest prior art as it discloses a multilayer tube ("Solar Metal Flex 2in2 ECO") for the hydraulic connection and wiring of solar panels and thus relates to the same technical field as the patent. Further, document E13 discloses all of the features of independent claim 1 except for aerogel as the insulation layer. Document E13 discloses a multilayer pipe ("Solar Metal Flex 2in2 ECO") for hydraulic connection and wiring of solar panels (see Fig. 1 annexed to the statement of grounds of appeal: "flexible connections for solar panels"). It comprises two tubes (see Figs. 2 and 3 annexed to the statement of grounds of appeal: "double tube", "two corrugated stainless steel tubes"); one for delivery and one for return of a heat transfer fluid designed to circulate in at least one solar panel to which the multilayer tube is connected (see Fig. 1 annexed to the statement of grounds of appeal). These tubes extend along parallel paths. The multilayer pipe also comprises a thermal insulation layer made of EPDM enveloping each tube, and a protection and containment sheath ("foil jacket") surrounding the tubes with the insulation layer (see the figures). The sheath is contoured to form a longitudinal channel for a wiring cable (Fig. 2 annexed to the statement of grounds of appeal: "two-core silicone sensing cable"). As shown in Figs. 2 and 3 annexed to the statement of grounds of appeal, this cable serves to connect a temperature sensor of the

solar collector supplied with a heat transfer fluid via the multilayer pipe to a control unit. The cable is located underneath the sheath, which protects not only the insulation layer but also the cable. Thus, a longitudinal channel for the sensor cable is formed by a corresponding contouring of the sheath. The sheath is contoured in such a way that two lateral, mutually separated ("tubes can be easily separated without damaging insulation or cover" or "separable") tube channels are formed (see Figs. 2 and 3 annexed to the statement of grounds of appeal). The outer black sheath of the multilayer pipe shown in document E13 consists of two individual tubes formed by the sheath, which are connected to each other by a web visible in the figures, the individual tubes or the sheath completely surrounding the respective insulations. Thus, the sheath is contoured so as to form two lateral mutually separated tubular channels, one for each of the tubes which are encased in the insulation layer. It follows that claim 1 only differs from the disclosure of document E13 in that the insulation layer is made of aerogel. The technical effect of this distinguishing feature is to improve the insulating effect of the insulation layer. The technical problem solved is to provide a multilayer tube for the hydraulic connection and wiring of solar panels, wherein the multilayer tube has improved insulation. The argument that the person skilled in the art would not have been able to make a technical improvement based on the pictures of a brochure, without seeing the real product, has no legal basis or support in previous decisions of the EPO. The person skilled in the art is equally competent to make technical improvements on the basis of a written disclosure.

Combination with document D7

The skilled person would have expected a combination of documents E13 and D7 to solve the technical problem, because document D7 relates to the same technical field of solar collectors and it is known from document D7 that a particularly good insulation layer can be achieved using aerogel (see paragraph [0021]: "silica aerogel is known as a high efficiency heat insulation material"). Furthermore, there is no technical obstacle to replacing the insulation layer made of EPDM, which is designed as a sheath in document E13, with the insulation layer made of aerogel, which is also designed as a sheath in document D7. Although document D7 mentions in paragraph [0035] that aerogel is a weak material, it does not advise against using it, as ways and means are also known to strengthen it. The skilled person would therefore have replaced EPDM with aerogel as the insulation layer and would have obtained a multilayer pipe comprising all of the features of independent claim 1 of the patent without having to be inventive. Consequently, the existence of an inventive step must be denied. In this context, reference is also made to the assertions that aerogel is the "best insulator" according to the Guinness Book of Records, which is cited in document E4'. The skilled person confronted with the technical task of improving the insulation effect would have used aerogel as the insulation material.

Combination with document E9

The skilled person would also have expected document E13 in combination with document E9 to solve the technical problem, since it is known from document E9 that a particularly good insulation layer can be

achieved by means of aerogel (see paragraph [0020]). Furthermore, there is no technical obstacle to replacing the insulation layer made of EPDM, which is designed as a sheath in document E13, with the insulation layer made of aerogel, which is also designed as a sheath in document E13 [sic]. Furthermore, there is no technical obstacle to combining the gauges of documents E13 and E9, as in both documents the insulation layer formed as a sheath can be placed around easily deformable, flexible pipes (see paragraph [0024] of document E9: "pipeline may or may not be flexible"). The skilled person would therefore have replaced EPDM with aerogel as the insulation layer and would therefore have obtained a multilayer pipe comprising all of the features of claim 1 of the patent without having to be inventive. Again, reference is also made to the assertions that aerogel is the "best insulator" according to the Guinness Book of Records, which is cited in document E4'. Thus, the skilled person confronted with the technical task of improving the insulation effect would have used aerogel as the insulation material. Even if the skilled person were to additionally use a foam layer, the result would still be covered by the wording of claim 1. For example, it is stated in paragraph [0025] of document E9 that even a partial covering with a foam layer is purposeful. Accordingly, the skilled person would have concluded that a foam layer is not indispensable. The same applies to an aerogel layer as described in paragraph [0024] of document E9, where an aerogel layer is reinforced with fibres and encased by a foam layer. Even this embodiment is encompassed by the wording of claim 1.

(ii) Respondent (patent proprietor)

The presence of aerogel is one of several differences between document E13 and claim 1 of the patent. In addition to this difference, the insulating layer of document E13 is not wrapped (i.e. wound) around the tube (feature 4b). Moreover, it should be noted that what is claimed is an inseparable assembly, one single product comprising tubes and an insulating layer wrapped around them, whereas the system of document E13 is a "2 in 2" twin pipe kit of parts where the tubes for the heat transfer fluid are inserted into pre-existing tubes of insulating material. This is also why document E13 is not a suitable starting point for the examination of inventive step. The skilled person would not have started from document E13 because there are huge technical differences, and it is not possible to simply replace the EPDM with aerogel, which cannot be shaped in the same way as EPDM. Also, in document E13 the protective cover is simply glued to the EPDM material. This could not be done if aerogel had been used as the insulator because it would modify the structure of the aerogel. This delicate material, unlike plastics, is difficult to use. This is why there are no aerogel tubes on the market.

Combination with document D7

Document D7 discloses a completely different invention. It was mentioned in the international search report, but it was not considered to be of particular relevance. Document D7 would not have been considered by the skilled person because (1) it relates to *flat* solar collectors (not suitable for tubes that are easily deformed), (2) in collectors insulation must guarantee light transmission (see paragraphs [0004],

[0012], [0021], [0023] of document D7), (3) it does not use aerogel wrapped around the tubes (see paragraph [0027] of document D7), (4) it discourages the skilled person from using aerogel with pipes (in the patent, no adhesive is used), and (5) it emphasises *difficulties* in working with aerogel material (see e.g. paragraphs [0006] and [0008] of document D7). Therefore, it would not have been possible to directly use the information mentioned in document D7 without additional technical knowledge or inventive skills.

Combination with document E9

Document E9 does not show the use of aerogel in corrugated pipes, and the methods of fixing aerogel to the pipe using a sheath are not described either. Furthermore, the method of fixing aerogel with cables is not demonstrated. Most importantly, the insulation described in document E9 is never made only of aerogel, but always also contains foam, see paragraph [0003]. This only proves that based on the teaching of document E9 the skilled person would not have been prompted to use aerogel without foam in the pipe of document E13. Although aerogel as an insulation material was known in the art *per se*, the skilled person would not have found any suggestion of the distinguishing features of claim 1 in order to solve the technical problems arising in other solutions. Hence, the subject matter of independent claim 1 involves an inventive step.

The fact that the claimed solution was inventive is also corroborated by secondary indicia such as its great commercial success and the fact that the invention constituted a response to a long-felt need.

Reasons for the Decision

1. Admittance of documents E13 to E16

1.1 Documents E13, E13' and E14

The appellant requested that document E13 be admitted into the proceedings.

Documents E13 and E13' were first filed by opponent 1 (now a party as of right) on 1 December 2017, in response to the summons to oral proceedings before the opposition division (see the decision under appeal, section 8 of the Summary of Facts and Submissions). Although the opposition division held the preliminary view that documents E13 and E13' were "more relevant than the other documents presented" and should be introduced into the proceedings, in the end it decided not to admit them (see sections 4.5 and 4.8 of the minutes of the oral proceedings). The opposition division justified this decision in section 5.1.3 of the Reasons for the decision under appeal:

"Document E13 and E13' are late filed and are not admitted in the proceedings according to Article 114(2) EPC. Document E13 appears to show a date of 06/2006 [sic] on the right-hand side side [sic] of the very last page. Nevertheless, as the original brochure corresponding to E13 has not been presented, neither the Opposition Division nor the parties can verify the consistency of the whole content of E13."

The appellant reacted to this finding by filing a certified copy of the brochure (document E14). The first four pages of document E14 correspond to pages 1

to 3 and 6 of document E13. The appellant explained that the missing pages 4 and 5 were insert pages for quick assembly. Consequently, these pages are undated and it cannot be ascertained whether they were included in the original brochure. Therefore, they cannot be taken into account as being part of the brochure.

Under Article 12(4) RPBA 2007, which is applicable in accordance with Article 25(2) RPBA 2020, the board has the power to hold inadmissible facts, evidence or requests which could have been presented or were not admitted in the proceedings before the department of first instance. In the board's view, the appellant has overcome the opposition division's objection that, lacking the original brochure, the content of document E13 could not be verified. The filing of document E14 constitutes a reaction to this objection, which was first raised during the oral proceedings before the opposition division. Therefore, the board has decided to admit documents E13, E13' and E14 into the appeal proceedings.

The allegation that document E13 is not *prima facie* relevant contradicts the opposition division's preliminary view mentioned above. The opposition division refused to admit the documents for other reasons, which have been overcome by the filing of document E14. The board also holds document E13 *prima facie* relevant.

The board does not share the respondent's doubts concerning the public availability of the brochure on the priority date of the patent (28 October 2009). The brochure is dated "06/2008" and there is no reason to assume that it was not distributed until more than a year later. That this was indeed the case is also

corroborated by document E13'. That Mr Froese's statement is not given in lieu of oath is less relevant, all the more as it only corroborates what is to be expected, i.e. that commercial brochures are distributed soon after being printed (see also "Case Law of the Boards of Appeal of the European Patent Office", 10th edition, 2022, section I.C.3.2.1 c). This publication will be referred to as "Case Law" in the following).

As document E13 contains pages that cannot be taken into account for the assessment of inventive step, the board will refer to document E14, it being understood that the relevant content of the brochure is what is common to documents E13 and E14.

1.2 Documents E15 and E16

Documents E15 and E16, an invoice relating to a prior sale and a further commercial brochure, were filed for the first time during the appeal proceedings to prove that document E13 was highly relevant. Since the board admitted document E13 into the appeal proceedings, *inter alia* because of its *prima facie* relevance, there is no need to rely on documents E15 and E16 in this regard. Moreover, these documents could and should have been filed during the proceedings before the department of first instance. Consequently, exercising its power under Article 12(4) RPBA 2007, the board has decided not to take these documents into account.

2. Abuse of procedure

The board is unable to see a manifest abuse of procedure. It is legitimate for an opponent whose opposition has been rejected to file an appeal. When

doing so, the appellant may base its appeal on documents filed by other opponents during the opposition proceedings if it considers these documents to be a more promising basis for requesting the revocation of the opposed patent (see also T 920/20, Reasons 4.4), regardless of whether the opponent that originally filed these documents also files an appeal.

3. Remittal to the opposition division

The appellant requested that, if necessary, the case be remitted to the opposition division for an assessment of the patentability of the subject-matter of the patent. The respondent did not react to this request. As the board sees no special reasons for a remittal in the sense of Article 11 RPBA 2020, this request is refused in accordance with Article 111(1) EPC.

4. Apportionment of costs

As the board is unable to see an abuse of procedure (see section 2. above), a different apportionment of costs is inequitable. Moreover, considering that the board has refused to remit the case to the opposition division (see section 3. above), the respondent cannot have incurred considerably higher costs as a result of the appellant's allegedly inappropriate behaviour. Therefore, the request for a different apportionment of costs under Article 104(1) EPC is refused (see also "Case Law", section III.R.2).

5. Interpretation of claim 1 as granted

Claim 1 defines a multilayer tube for (i.e. suitable for) the hydraulic connection and wiring of solar panels. Contrary to what the expression "multilayer

tube" might suggest, the object defined by claim 1 is not just a tube whose wall comprises several layers. Feature 2 requires that this "tube" itself comprises at least two tubes that are suitable for carrying a heat transfer fluid of the kind used in solar panels. In accordance with feature 3, these two tubes extend parallel to each other. A thermal insulation layer made of aerogel is wrapped around each of these tubes (features 4a, 4b and 7). The assembly is surrounded by a sheath (feature 5). The sheath is designed in such a way that it forms a longitudinal channel suitable for an electrical wiring cable (feature 6) and two distinct tubular channels for each of the tubes (feature 8).

What exactly is meant by the feature that the sheath is "contoured so as to form a ... channel" (features 6 and 8)? The patent does not define this wording. The definitions for "contoured" according to the online Oxford English Dictionary (OED) ("rounded in outline" and "furnished with contour lines") appear not to be applicable. The skilled person would have understood it to be equivalent to "shaped". In accordance with this understanding, feature 6 means that the sheath is shaped in such a way that it forms a longitudinal channel for a wiring cable. Feature 8 is understood to mean that the sheath is shaped in such a way that it forms tubular channels for the insulated tubes.

Another issue to be considered is what exactly is meant by "wrap" (feature 4b) and "wrapped" (feature 8), respectively. There is no definition in the patent. The common meaning of the word is "to cover or envelop" (OED). The word is often employed in the sense of "to cover or envelop (an object) by winding or folding something round or about it; to surround with or enwrap in a covering, wrapper, or the like, esp. so

as to protect from injury, damage, loss, etc." (OED). Another definition offered by the OED is "to spread or extend around, about, or over (something); to surround, encompass". In the present context, the board needs to decide whether the fact that the insulation is "arranged so as to wrap around each tube" means that each tube is simply surrounded by insulating material. As pointed out by the respondent, this is unlikely because feature 5 uses the term "surrounded". In features 4b and 8, the drafter seems to have used a different word on purpose. Consequently, the board interprets the term "wrap" as "to cover or envelop by winding or folding something round or about it".

6. Main request: inventive step in view of document E14

6.1 Disclosure of document E14

Document E14 discloses a multilayer tube (*Doppelrohr*) for the hydraulic connection and wiring of solar panels, comprising two tubes (see the photographs and drawings on page 2). The multilayer tube is designed for carrying heat transfer fluids circulating in solar panels (see the illustration on page 3, bottom left). The tubes extended along parallel paths (see the same illustration). They comprise a thermal insulation layer (*pre-insulated*) provided around each tube (see the illustrations on page 2) and a protection and containment sheath (*protective outer cover*) arranged so as to surround both tubes with their insulating layer. The sheath is contoured so as to form two lateral mutually separate tubular channels (see the illustrations on page 2) and a longitudinal containment channel for at least one electrical wiring cable (both drawings on page 2 show a sensor cable).

6.2 Suitability as starting point

The board cannot endorse the argument that document E14 is not a suitable starting point for the examination of inventive step. The pipe systems of document E14 belong to the same technical field and have the same purpose as the claimed multilayer tube. The board is not aware of any reason that would disqualify the pipe systems of document E14 as a starting point for the examination of inventive step.

6.3 Differences

It is undisputed that claim 1 differs from the disclosure of document E14 in that the insulation layer is made of aerogel, whereas in document E14 the insulation layer is made of EPDM (see page 2).

It was argued that in the device of document E14, the insulation layer is not wrapped around each tube (feature 4b, see also feature 8, according to which each tube is "wrapped in" the aerogel insulating layer). The insulating layer of document E14 is presented as consisting of EPDM insulating hoses with a foil coating (*EPDM-Isolierschläuche mit Folienummantelung*), and the illustrations on page 2 do not suggest that the insulating material is wound or folded around the tubes either. Therefore, in view of the board's interpretation of the term "wrap" as set out in section 5. above, the board agrees that document E14 does not disclose feature 4b.

The presence of a sheath (feature 5) is not a distinguishing feature. Document E14 discloses that the insulating material has a foil coating (*Folienummantelung*), which qualifies as a sheath. The argument that

the sheath of document E14 is glued and not resistant is invalid because claim 1 does not explicitly rule out gluing and does not qualify the resistance of the sheath.

The fact that the bridge between the tubes is "very small" in document E14 does not constitute a distinguishing feature either. Claim 1 does not require any particular bridge size.

Finally, it was argued that the device of document E14 did not disclose features 6 and 8 because it was not contoured so as to form a channel for a wiring cable and separate channels for each insulated tube. The board partly disagrees. One of the common meanings of "channel" is "pipe, tube or groove" (see the corresponding entry in the OED). The sheath of the device of document E14 is shaped such as to form a tubular channel for each of the two tubes. Thus, feature 8 is disclosed. However, feature 6 is not disclosed because there seems to be no channel for the wire, which is simply squeezed between the insulating material and the sheath. Put differently, it is not the shape of the sheath that generates a channel for the wire.

Thus, document E14 does not disclose features 4b, 6 and 7. These distinguishing features form two groups: features 4b and 7 belong together because the way in which the insulation layer is disposed around each tube is related to the nature of the layer. Feature 6 is different and can be treated independently. It will be shown in the following that features 4b and 7 as such justify the existence of an inventive step. Therefore, it is not necessary to examine whether or not feature 6 involves an inventive step.

6.4 Objective technical problem solved by features 4b and 7

The appellant argued that the objective technical problem solved by feature 7 consisted in the improvement of the insulating effect of the insulation layer. The board has adopted this formulation in the following.

6.5 Obviousness for the skilled person

The appellant's core argument was that the skilled person starting from document E14 and wishing to improve the insulating effect of the insulation layer would have been led to the invention by documents D7 or E9. This assertion is unfounded.

It is undisputed that aerogel as such and its high potential as insulating material was known to the skilled person on the priority date.

Nonetheless, it is not plausible that the skilled person starting from document E14 and wishing to improve the insulating effect of the insulation layer would have replaced the EPDM tubes of document E14 with layers of aerogel wrapped around each tube. This is because a simple replacement of the EPDM tubes with tubes made of aerogel is not feasible. Consequently, the use of aerogel would have necessitated a complete redesign of the device of document E14. Although document D7 and document E9 disclose devices in which aerogel is used as insulating material, they do not provide any instruction that would have led the skilled person to the subject-matter covered by claim 1.

6.5.1 Document D7

Document D7 discloses solar heat collector panels. It intends to provide a "a flat panel solar heat collector, the shape and size of which can be changed with a high degree of flexibility in order to meet the demands of consumers" but also "a solar heat collector panel which has improved heat insulation performance and heat collection efficiency" and "the simplification of the structure of the flat panel" (paragraph [0009]).

The solution proposed by this document comprises the features that the panel has "a structure in which a heat collection plate and a pipe for a heating medium are integrally formed with a transparent heat insulating material" (see paragraph [0011]) and "that the heat collection plate is coated with a selective absorption film of MOxNy (where M is Ti (titanium) or Al [*sic*] (aluminum)) and said transparent heat insulating material is silica aerogel" (see paragraph [0012]). It is also suggested "that the pipe for the heating medium be joined with the heat collection plate" (see paragraph [0013]). However, document D7 is not concerned with the insulation of the tubes carrying a heat transfer fluid. It is not plausible that the skilled person contemplating document D7 would have taken the mere fact that silica aerogel is disclosed as transparent heat insulating material for the panel as an incentive to replace the EPDM material insulating the tubes of document E14 with aerogel material and to wrap this material around the tubes. The appellant's argument is based on hindsight.

6.5.2 Document E9

Document E9 relates to insulation systems comprising foam and aerogel materials, and in particular fibre-reinforced aerogels (see paragraph [0002]). It is doubtful that the skilled person starting from the device of document E14 would have sought a solution to the objective technical problem in document E9. It is true that document E9 discloses that "Aerogel materials are excellent insulators due to their low density and highly porous structure" (see paragraph [0013]), but this teaching as such is not sufficient to lead the skilled person to wrapping aerogel material around the tubes of document E14. The objection based on a combination of documents E14 and E9 is based on hindsight.

6.5.3 Common general knowledge

The appellant referred to a Wikipedia extract concerning "Aerogel" (document E4'), which refers to aerogel as being referenced in the Guinness Book of Records as the "best insulator". The board is doubtful that this disclosure can constitute evidence that it was part of the skilled person's common general knowledge before the priority date of the patent that aerogel was a better insulator than EPDM for the applications under consideration. This would have to be established on the basis of textbooks or reference works that reflect the skilled person's relevant common general knowledge at the relevant time.

6.6 Conclusion

The appellant has not established in a convincing way that the subject-matter of claim 1 lacks inventive step in view of document E14 in combination with document D7

or E9, due account being taken of the skilled person's common general knowledge.

It follows that the ground for opposition pursuant to Article 100(a) EPC in combination with Article 56 EPC does not prejudice the maintenance of the patent as granted and that the appeal must be dismissed.

Order

For these reasons it is decided that:

1. The appeal is dismissed.
2. The respondent's request for apportionment of costs is refused.

The Registrar:

The Chairman:



N. Schneider

P. Lanz

Decision electronically authenticated