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**Datasheet for the decision
of 18 October 2022**

Case Number: T 2332/19 - 3.3.09

Application Number: 10742871.6

Publication Number: 2454313

IPC: C08J9/00, C08J9/20

Language of the proceedings: EN

Title of invention:

THERMO-INSULATING EXPANDED ARTICLES AND COMPOSITIONS FOR THE
PREPARATION THEREOF

Patent Proprietor:

versalis S.p.A.

Opponent:

Total Research & Technology Feluy

Headword:

Thermo-insulating expanded articles/VERSALIS

Relevant legal provisions:

EPC Art. 56, 83

RPBA Art. 12(4)

Keyword:

Main request - inventive step - (yes)
Sufficiency of disclosure - (yes)
main request - admitted (yes)

Decisions cited:

T 1772/09, T 2152/18

Catchword:



Beschwerdekammern
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Case Number: T 2332/19 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 18 October 2022

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 June 2019 concerning maintenance of the
European Patent No. 2454313 in amended form.**

Composition of the Board:

Chairman A. Haderlein
Members: M. Ansorge
N. Obrovski

Summary of Facts and Submissions

- I. The proprietor and the opponent both lodged an appeal against the opposition division's interlocutory decision holding the then first auxiliary request allowable.
- II. With its notice of opposition, the opponent had requested that the patent be revoked on the grounds for opposition under Article 100(a) EPC in conjunction with Article 56 EPC (lack of inventive step) and Article 100(b) EPC.
- III. The opposition division decided that the then main request (claims as granted) did not meet the requirement of Article 56 EPC, but that the then first auxiliary request met the requirements of Articles 83 and 56 EPC.
- IV. The following documents were cited in the proceedings:
- E6: EP 1 587 860 B1
 - E7: WO 2007/119102 A2
 - E10: WO 2007/121928 A1
 - E11: EP 1 114 089 B1
 - E13: WO 2007/023091 A1
 - E15: US 2008/0234400 A1
 - E16: WO 2008/141767 A2
 - E30: Experimental report "Computation of deformation of EPS sheets containing coke and graphite: pure (black) vs mixed (black and white)", filed by the proprietor
 - E34: Diagram "Conductivité therm. 10°C Vs densité", filed by the opponent

E35: Experimental report "On the measurable effect of coke in Example 8 of E30 in relation to patent EP2454313B1", filed by the proprietor

V. Independent claims 1 and 4 of the main request (filed as the first auxiliary request with the statement of grounds of appeal) differ from claims 1 and 4 of the then first auxiliary request held allowable by the opposition division as follows (see deletions and highlighting in strikethrough and bold):

"1. Thermal-insulating expanded articles, having a density ranging from 5 to 50 g/l, obtainable from compositions of particles of expandable vinyl aromatic polymers comprising:

a. 10-90% by weight of beads/granules of expandable vinyl aromatic polymer pigmented by means of an athermanous material comprising from 0.5 to ~~15%~~ **25%** by weight of coke in particle form with an average particle size (dimensional) ranging from 0.5 to 100 μm and a surface area, measured according to ASTM D-3037-89 (BET), ranging from 5 to 50 m^2/g ;

b. 90-10% by weight of beads/granules of essentially white expandable vinyl aromatic polymer."

"4. Compositions of beads/granules of vinyl aromatic polymer suitable for use in the preparation of thermal-insulating expanded articles, comprising:

a. 10-90% by weight of beads/granules of expandable/expanded vinyl aromatic polymer pigmented with an athermanous material comprising from 0.5 to ~~15%~~ **25%** by weight of coke in particle form with an average particle size (dimensional) ranging from 0.5 to 100 μm

and a surface area, measured according to ASTM D-3037-89 (BET), from 5 to 50 m²/g;

b. 90-10% by weight of beads/granules of essentially white expandable/expanded vinyl aromatic polymer."

Claims 2, 3 and 5 to 11 of the main request are dependent claims.

VI. The parties' relevant arguments, submitted in writing and during the oral proceedings, are reflected in the reasons for the decision below.

VII. Requests

The proprietor requested that the decision be set aside and that the patent be maintained on the basis of the main request (filed as the first auxiliary request with the statement of grounds of appeal) or, as an auxiliary measure, on the basis of the first auxiliary request (filed as the second auxiliary request with the statement of grounds of appeal).

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

Reasons for the Decision

MAIN REQUEST

1. Admittance of the main request

1.1 The opponent requested that the main request not be admitted into the proceedings, arguing that it had been

filed for the first time with the statement of grounds of appeal but could not be considered a reaction to a new fact submitted (possibly late-submitted) by the opponent in the opposition proceedings. Thus, the main request should have been filed in the first-instance proceedings.

- 1.2 The board does not concur. While it may have been possible to file the main request during the oral proceedings before the opposition division, this request essentially corresponds to the then first auxiliary request which was held allowable by the opposition division, the only difference being that there is now a higher upper limit of 25% by weight for the coke in claims 1 and 4 of the main request *versus* 15% by weight of coke in claims 1 and 4 of the request held allowable by the opposition division. The upper limit in claims 1 and 4 had not been under particular dispute in the proceedings before the opposition division, nor is the opponent arguing that this amendment would constitute a problem now. The main request does not amount to a fresh case and allows the grounds which led to the impugned decision to be reviewed.

In view of the above, the board decided to admit the main request into the proceedings (Article 12(4) RPBA 2007).

2. Article 123(2) EPC

It was uncontested that claims 1 and 4 met the requirement of Article 123(2) EPC. The board finds that their subject-matter is disclosed in claims 1 and 4 of the application as filed in combination with page 4, lines 5 to 23 of the application as filed.

3. Interpretation of claims 1 and 4

3.1 Claim 1 comprises the feature "a. 10-90% by weight of beads/granules of expandable vinyl aromatic polymer pigmented by means of an athermanous material comprising from 0.5 to 25% by weight of coke in particle form with an average particle size (dimensional) ranging from 0.5 to 100 μm and a surface area, measured according to ASTM D-3037-89 (BET), ranging from 5 to 50 m^2/g " (emphasis added).

From a purely linguistic point of view the feature "comprising from 0.5 to 25% by weight of coke in particle form ..." in claim 1 might, at first glance, be understood as relating to the athermanous material and not to the beads/granules of expandable vinyl aromatic polymer. However, when reading claim 1 from a technical point of view, as a skilled person would, and with a mind willing to understand, the feature "comprising from 0.5 to 25% by weight of coke in particle form ..." must relate to the beads/granules of expandable vinyl aromatic polymer. In the board's view, this is the only sensible interpretation a skilled person would derive when reading claim 1 in the light of the whole context of the patent. For instance, examples 1 to 3 of the patent are in line with this claim interpretation. In this context, the board agrees with the opposition division's interpretation of claim 1.

3.2 The same applies to claim 4 of the main request, which contains the same contentious feature.

4. Sufficiency of disclosure

4.1 The opponent submitted that the invention could not be carried out by a skilled person. In particular, the opponent argued that the particle size was insufficiently defined, referring in this context to T 1772/09. In addition, it submitted that the feature "an athermanous material comprising from 0.5 to 25% by weight of coke in particle form ..." was not unambiguous. In its view, the range of 0.5 to 25% by weight related to the athermanous material and not to the beads/granules.

4.2 The opponent referred to T 1772/09, which was allegedly similar to the case in hand in so far as the issue of particle size measurements was concerned. Since the competent board in T 1772/09 decided that there was a lack of sufficiency due to missing information concerning the particle size measurement, the same conclusion should also be reached in the case in hand.

However, the opponent did not provide any reasons why case T 1772/09 was supposedly similar to this one or why its conclusion should be transferred to the specific case in hand, which deals with a completely different technical field. In T 1772/09 the competent board held that the skilled person would not have had sufficient information to correlate a mean particle size, measured for any given batch of the compound in question, with an intended parameter also called for in the independent claim. The current case is different. Among other things, it is not necessary to correlate different parameters in order to reproduce the invention (see also T 2152/18, Reasons 3.10.2). In addition, the opponent did not submit any experimental

evidence to raise serious doubts that the invention could be carried out. In the board's view, measuring the particle size of coke is a routine measure for a skilled person. In the specific case in hand, certain deviations in the particle size, resulting from the application of different methods, amount at most to a question of clarity but not to one of sufficiency of disclosure.

4.3 Moreover, a skilled person would interpret the wording of claims 1 and 4 of the main request as mentioned under point 3 above. Consequently, the feature "comprising from 0.5 to 25% by weight of coke in particle form ..." relates to the beads/granules of expandable vinyl aromatic polymer and not to the athermanous material as asserted by the opponent.

4.4 In view of the above, the opponent's objections in this regard only concern a matter of clarity - if anything - but do not amount to a lack of sufficiency of disclosure. Thus, the opposition division correctly assessed the issue of sufficiency of disclosure.

The invention can therefore be carried out by a person skilled in the art (Article 83 EPC).

5. Inventive step

5.1 The opponent argued that the subject-matter of claims 1 and 4 of the main request did not involve an inventive step in view of E10 (or E6) as the closest prior art.

5.2 E10 relates to a foam insulating material made of athermanous materials containing expandable styrene polymer particles. The athermanous materials are reflector particles and absorption particles. The foam

insulating material may be used in sheet form for thermal insulation and for insulation purposes in buildings (see the abstract of E10).

- 5.3 E6 relates to an insulating foamed material which has been formed from expandable styrene polymer particles, formed from 10 to 90% by weight of pigmented styrene polymer particles and from 90 to 10% by weight of pigment-free styrene polymer particles (see claim 1 of E6).
- 5.4 There was agreement between the parties that the subject-matter of claim 1 (and of claim 4) of the main request differed from E10 (and E6) in that in E10 (and E6) coke in particle form with an average particle size (dimensional) ranging from 0.5 to 100 μm and a surface area, measured according to ASTM D-3037-89 (BET), ranging from 5 to 50 m^2/g was not disclosed as the athermanous material of the pigmented dark or grey beads/granules.
- 5.5 However, there was disagreement between the parties whether there was an effect, shown over the closest prior art, resulting from the distinguishing feature.
- 5.6 Firstly, the opponent contested that the technical problems of improving foamability, thermal conductivity and flame resistance were derivable from the application as filed at all.

However, the problem of providing expanded articles having improved thermal conductivity and resistance to deformation is clearly mentioned in the patent (see paragraph [0003] and the examples of the patent). Thus, in applying the problem-solution approach, these

effects may be relied on to demonstrate an improvement over the closest prior art.

- 5.7 Secondly, the opponent argued that no improvement - more precisely no improved thermal conductivity - was shown in view of the closest prior art (E10 or E6).
- 5.8 The board does not agree for the following reasons.
- 5.8.1 The experimental reports E30 and E35 demonstrate that the thermal conductivity of sheets produced with 60% by volume of EPS beads having 1.5% of coke and 40% by volume of (essentially white) EPS beads without any athermanous additive is closer to the thermal conductivity of sheets produced with 100% of EPS beads containing athermanous material than to that of sheets produced with 100% of EPS beads without any athermanous additive.
- 5.8.2 In particular, a comparison of comparative example 7 of E30 (using graphite as disclosed in E10 or E6) with example 8 of E30 (using the coke defined in claims 1 and 4 of the main request) shows that using the coke as required in claims 1 and 4 of the main request performs better than graphite as mentioned in E10 (or E6) in terms of thermal conductivity.
- 5.8.3 The opponent's experiments (see E34) relate to conductivity tests on samples having 0.15% and 0.5% coke based on the polymer. These tests carried out by the opponent are not suitable for demonstrating that no effect is achieved over the closest prior art (E10 or E6). Instead, they are intended to demonstrate that there is no significant difference between a sample having no athermanous additive and samples having 0.15 and 0.5% by weight based on the polymer.

5.8.4 Although the improvement in thermal conductivity over E10 (and E6) is not a large improvement, it is considered significant (see E35). In this context, the board does not share the opponent's view that the improvement in thermal conductivity is merely within the typical error margin. As can be taken from E35 for instance, the standard error is remarkably lower than the improvement in thermal conductivity over E10 (or E6).

5.8.5 In this context, the opponent also referred to paragraph [0028] of the patent and argued that the claimed expanded articles might even contain higher amounts of graphite and/or carbon black compared with the coke required in claim 1 of the main request. In its view, it was not credible that improved thermal conductivity was also achievable for such an embodiment covered by claim 1 of the main request.

5.8.6 Paragraph [0028] of the patent reads as follows:

"According to the present invention, the athermanous filler of coke added to the vinyl aromatic polymer, can comprise up to 5% by weight, calculated with respect to polymer (a), for example from 0.01 to 5% by weight, preferably from 0.05 to 4.5%, of graphite and/or carbon black respectively."

Thus, graphite and/or carbon black may be used in the patent as athermanous materials in addition to the specific coke required in claims 1 and 4 of the main request. From a theoretical perspective, it cannot be ruled out that an embodiment having a higher amount of graphite and/or carbon black (e.g. up to 5% by weight) compared with coke (e.g. 0.5% by weight) does not show

an improvement over a comparative embodiment having no added coke, as asserted by the opponent. However, the opponent did not provide any evidence, e.g. in the form of experimental data, to substantiate this assertion. For want of any evidence, the opponent's assertion cannot be given any evidential weight, keeping in mind that the experiments shown in E30 attest to the fact that using the coke as required in claims 1 and 4 of the main request leads to improved thermal conductivity over graphite as described in E10 (or E6).

- 5.8.7 In view of the above, the board acknowledges that the distinguishing technical feature over E10 (and E6) leads to the claimed product having improved thermal conductivity.
- 5.9 In view of the above, the objective technical problem to be solved is providing an expanded article having at least improved thermal conductivity.
- 5.10 With respect to the question of obviousness, it is noted that none of documents E7, E11, E13, E15 and E16 teaches or suggests that said improvement can be achieved by applying 0.5 to 25% by weight of coke in particle form with an average particle size (dimensional) ranging from 0.5 to 100 μm and a surface area, measured according to ASTM D-3037-89 (BET), ranging from 5 to 50 m^2/g , in the pigmented beads/granules of expandable vinyl aromatic polymer. Accordingly, a skilled person would not expect to solve the objective technical problem by replacing graphite (as taught in E10 and E6) with the specific coke required in claims 1 and 4 of the main request or by adding it to the dark or grey beads/granules of E10 or E6.

Thus, the subject-matter of claim 1 involves an inventive step in view of E10 (or E6) as the closest prior art. The same applies to independent claim 4 and to dependent claims 2, 3 and 5 to 11.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent as amended in the following version:
 - claims 1-11 according to the main request filed as the first auxiliary request with the statement of grounds of appeal

 - description pages 1-22 submitted during the oral proceedings before the board

The Registrar:

The Chairman:



M. Schalow

A. Haderlein

Decision electronically authenticated