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Datasheet for the decision of 11 June 2014

Case Number: T 0179/13 - 3.3.09

Application Number: 04747876.3

Publication Number: 1659145

IPC: C08J9/18, C08J9/232

Language of the proceedings: EN

Title of invention:
PRE-EXPANDED PARTICLE OF OLEFIN-MODIFIED POLYSTYRENE RESIN, PROCESS FOR PRODUCING THE SAME, AND MOLDED FOAM

Patent Proprietor:
Sekisui Plastics Co., Ltd.

Opponent:
Kaneka Corporation

Headword:

Relevant legal provisions:
EPC Art. 100(b)

Keyword:
Grounds for opposition - insufficiency of disclosure (no)

Decisions cited:

Catchword:

Europäisches Patentamt
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Case Number: T 0179/13 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 11 June 2014

Appellant: (Patent Proprietor)	Sekisui Plastics Co., Ltd. 4-4, Nishitenma 2-chome, Kita-ku Osaka-shi, Osaka 530-0047 (JP)
Representative:	HOFFMANN EITLE Patent- und Rechtsanwälte Arabellastrasse 4 81925 München (DE)
Respondent: (Opponent)	Kaneka Corporation Asahi Shinbun Bldg. 3-2-4, Nakanoshima, Kita-ku OSAKA, 530-8288 (JP)
Representative:	TBK Bavariaring 4-6 80336 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 19 November 2012 revoking European patent No. 1659145 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	W. Sieber
Members:	M. O. Müller
	E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the proprietor of European patent No. 1 659 145 against the decision of the opposition division to revoke it.

II. The opponent had requested revocation of the patent in its entirety on the grounds that the claimed subject-matter was neither novel nor inventive (Article 100(a) EPC), that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC), and that the patent contained subject-matter which extended beyond the content of the application as filed (Article 100(c) EPC).

The documents submitted during the opposition proceedings included:

E5: Experimental report No. S502729-01 by Toray Research Center, Inc., 28 November 2008;

E11: "Relationship between pressure and absorbance ratio";

E12: MAGNA-IR (FT-IR Spectrometers) E.S.P. System 560 and 760 User's Guide, Nicolet Instrument Corporation, 1997;

E13: Reply of Thermo Fisher Scientific Co., Ltd. to Sekisui Plastics Co., Ltd.;

E14: Spectra-Tech Foundation Series, FT-IR Sampling Accessories, Thermo Fisher Scientific Inc., 2003 and 2008; and

E15: Thunderdome User's Manual for P/N 0009-1XX, Version 2.1, Spectra-Tech.

III. The decision of the opposition division was based on a main request filed with letter of 29 March 2011, and a first, second and corrected third auxiliary request. Claim 1 of the main request reads as follows:

"1. Pre-expanded beads of olefin-modified polystyrene-based resin, wherein a styrene-based monomer forming a polystyrene-based resin in the beads is used in the range of 100 to 1,000 parts by weight relative to 100 party by weight of a polyethylene-based resin, a bulk density of each bead is 0.012 to 0.20 g/cm^3, and an absorbance ratio at 698 cm^{-1} and 2850 cm^{-1} (D_{698}/D_{2850}) obtained from an infrared absorption spectrum of each bead surface measured by ATR method infrared spectroscopy is in the range of 0.1 to 2.5, and wherein the ratio of the polyethylene-based resin near a surface of the pre-expanded bead is more than 50% by weight, but less than 100% by weight."

In the same way as claim 1 of the main request, claim 1 of each auxiliary request contained the requirement that "an absorbance ratio at 698 cm^{-1} and 2850 cm^{-1} (D_{698} /D_{2850}) obtained from an infrared absorption spectrum of each bead surface measured by ATR method infrared spectroscopy is in the range of 0.1 to 2.5".

The main request was found to meet the requirements of Articles 123(2), 123(3) and 100(c) EPC. Furthermore, according to the opposition division no lack of clarity resulted from the amendment of "polyolefin-based resin" in claim 1 as granted to "polyethylene-based resin", since the latter term was clearly and unambiguously understandable for the skilled person.

However, the invention underlying the main request and all auxiliary requests was considered to be insufficiently disclosed. More particularly, the decision cascade needing to be applied by the skilled person to measure the claimed absorbance ratio was highly ambiguous and therefore an insufficient technical teaching. Actually, a clear and unambiguous technical teaching was not provided enabling the average expert to carry out said absorbance ratio measurement in practice in a reproducible manner. The vague and ambiguous technical information provided by the patent specification was not a disclosure enabling the average expert to carry out the teaching of the patent without undue burden.

IV. The proprietor (hereinafter: "the appellant") filed an appeal and together with the statement setting out the grounds of appeal submitted:

E23: Datasheet "Smart ARK™", Thermo Fisher Scientific Inc., 2003 and 2008;

E24: Datasheet "The ARK™ Attenuated Total Reflectance Kit", Spectra-Tech, 1998;

E25: S. Terasaki, "Excerpts from on-screen user's manual of SpeculATR module", 30 January 2013;

E26: Installation and User Guide MIRacle™ A, PIKE Technologies, Inc.; and

E27: Experimental report by S. Terasaki, "Observation by SEM (scan electron microscope): the cell membrane and cell structure present, under pressure, in the

outermost area of pre-expanded particle", 11 January 2013.

V. In its letter dated 21 May 2013, the opponent (hereinafter: "the respondent") only requested copies of pages 4 and 5 of E27 in a better quality. These were duly provided by the appellant.

VI. The board summoned the parties to oral proceedings. In its subsequent communication, the board indicated that during the oral proceedings there would be a discussion of whether the decision cascade to be applied by the skilled person to measure the absorbance ratio was indeed ambiguous. The board observed that if the outcome of this discussion was that the skilled person would use the Thunderdome accessory in connection with the MAGNA560 spectrometer, then in its preliminary view, there would be no variables and thus the disclosure would be sufficient.

VII. The respondent announced that it would not be attending the scheduled oral proceedings. In fact, the respondent did not file any arguments or requests in the appeal proceedings.

VIII. As announced, the respondent was not present at the oral proceedings held on 11 June 2014. The appellant maintained its requests filed during the written proceedings.

IX. In so far as relevant to the present decision, the appellant's arguments, as presented during the written and oral proceedings, can be summarised as follows:

On the basis of the opposed patent, the skilled person knew that the absorbance ratio had to be measured by

one time reflection ATR spectroscopy using the spectrometer "MAGNA560", which was erroneously denoted "MAGMA560" in the patent. In order to know how to operate this spectrometer, the skilled person would look into the manual of the spectrometer E12. Since the patent used ATR, the skilled person would look into the ATR accessories of E12, which were described starting at page 82. From those described, the skilled person would use the Single Bounce Horizontal ATR accessory, since it was the only one which was identified in E12 as a one time reflection accessory. The other ATR accessories of E12 would not have been used by the skilled person. The ATR needle probe and FibreLink™ accessory were only suitable to analyse liquids. The Attenuated total reflection kit used multiple rather than single reflection type ATR, as evidenced by E23 and E24. In the description of the ProfilIR® accessory, no information was given whether this was a one time or multiple reflection type accessory or whether it could be automatically recognised. Lastly, the specular reflection accessory did not use ATR but was based on a different measurement method. Thus, the skilled person seeking supplementary equipment in order to render a spectrometer of the type "MAGNA560" suitable for performing a one time reflection type ATR measurement would have selected the Single Bounce Horizontal ATR accessory. On the basis of the explanation E13, it was apparent that at the priority date there were only two Single Bounce Horizontal ATR accessories available, namely the SpeculATR accessory and the Thunderdome accessory that could be connected to the MAGNA560 spectrometer by automatic recognition. As could be deduced from E25, the SpeculATR accessory was only suitable for samples with flat surfaces and could thus not be used for round polymer beads. On the other hand, as evidenced by E14, the Thunderdome accessory could be

used with polymer beads. Consequently, the skilled person would have used the MAGNA560 spectrometer in combination with the Thunderdome accessory. By doing so, the skilled person would have had no freedom when determining the absorbance ratio. Firstly, as was apparent from E14 and E15, the Thunderdome accessory used a Germanium crystal and thus the type of crystal was not a variable. Secondly, the incidence angle in the Thunderdome accessory was approximately 45°, and therefore also not a variable. Lastly, the sample was pressed to the ATR crystal in the Thunderdome accessory by a slipping clutch mechanism and as evidenced by E15, pressure was increased until an audible click was heard. The pressure was thus inherent to the pressure device of the Thunderdome accessory. Irrespective of this, it could be deduced from E11 that the absorbance ratio became constant from a certain pressure onwards. It would be part of the skilled person's common general knowledge to work in this regime of constant absorbance ratio. This was confirmed by E26, where the skilled person was instructed to increase the pressure until the peak intensity became stable. There was thus no variability as regards the pressure with which the sample had to be pressed to the ATR crystal in the Thunderdome accessory. Since there were no variables when measuring the absorbance ratio, the absorbance ratio was not ambiguous as alleged. Without any ambiguity, there could be no insufficiency.

X. The appellant requested that the decision under appeal be set aside, that the subject-matter defined in the claims filed in the opposition proceedings as the main request or, subsidiarily, as the first, second or corrected third auxiliary request be acknowledged as complying with Article 83 EPC and that the case be

remitted to the opposition division for further prosecution.

Reasons for the Decision

1. The appeal is admissible.

2. Main request - Amendments - Articles 100(c), 123(2) and (3) EPC

According to the decision of the opposition division, the main request meets the requirements of these articles. This was not disputed by the respondent and the board does not see any reason to differ.

3. Main request - Amendments - Article 84 EPC

The "polyolefin-based resin" in claim 1 as granted was specified to be a polyethylene-based resin in claim 1 of the main request. According to the decision of the opposition division, the term "polyethylene-based resin" was clearly and unambiguously understandable for the skilled person. This was not disputed by the respondent and the board again sees no reason to differ. Therefore, the specification of the polyolefin-based resin as a polyethylene-based resin in claim 1 of the main request meets the requirements of Article 84 EPC.

4. Main request - Sufficiency - Article 100(b) EPC

4.1 The opposition division held that the "decision cascade" that had to be applied by the skilled person in order to determine the absorbance ratio D_{698}/D_{2850} required by claim 1 was "highly ambiguous" and therefore amounted to "an insufficient technical teaching". It therefore concluded that the features of claim 1 relating to the absorbance ratio violated the provisions of Article 100(b) EPC.

Hence, the sole issue to be decided in the present appeal is whether the absorbance ratio is indeed ambiguous and, if so, whether this gives rise to insufficiency of disclosure.

4.2 The absorbance ratio is measured according to the patent (paragraph [0025]) by using one time reflection-type ATR (attenuated total reflection) infrared spectroscopy. To obtain the spectra, an ATR crystal (referred to as "prism" in the patent) having a high reflective index is adhered to the sample, the sample is irradiated with infrared rays through the ATR crystal and the light emitted from the ATR crystal is analysed spectroscopically. By this method the surface of a sample can be analysed to a depth of a few micrometres (paragraph [0026]). In paragraph [0105], the method is described in more detail. Ten pre-expanded beads are selected randomly. They are then analysed as regards their infrared absorption spectra, e.g. by a measurement apparatus sold by Nicolet Instrument Corp. under the trade name "Fourrier transformation infrared spectrometer MAGMA560". As not disputed by the respondent, "MAGMA560" should correctly read "MAGNA560". The maximum and minimum values so

obtained are excluded and the arithmetic average of the remaining eight absorbance ratios is determined.

On the basis of this information in the patent, the skilled person would thus know that in order to determine the absorbance ratio he has to carry out a one time reflection ATR measurement with a MAGNA560 spectrometer.

4.3 In order to know how to operate the MAGNA560 spectrometer, the skilled person would look into the manual of this spectrometer, which, in the present proceedings, is E12. Since the opposed patent specifically refers to ATR, the skilled person would specifically look in E12 for ATR accessories that can be used together with the MAGNA560 spectrometer, and by doing so would find the following entries:

- the ATR needle probe and FibreLink™ accessory (page 83);
- the Attenuated total reflection kit (the A.R.K.™) (page 83);
- the ProfilIR® accessory (page 85); and
- the Single Bounce Horizontal ATR accessory (SB-HATR) (page 86).

The only ATR accessory that is specifically described in E12 as suitable for a one time reflection ATR method is the Single Bounce Horizontal ATR accessory. More specifically, the term "Single Bounce" implies that the IR light is bounced back, i.e. reflected, from the sample only once.

The skilled person wanting to carry out the one time reflection ATR measurement described in the patent

would thus use the MAGNA560 spectrometer together with a Single Bounce Horizontal ATR accessory.

4.4 As explained in E13 by Thermo Fisher Scientific Co., Ltd., which is the legal successor of the producer of the MAGNA560 spectrometer (Nicolet Instrument Corporation, see paragraph [0105] of the patent), there were two different Single Bounce Horizontal ATR accessories at the priority date of the patent that could be connected to this spectrometer by automatic recognition, namely the SpeculATR accessory and the Thunderdome accessory. In the absence of any proof to the contrary, the board assumes that these were the only two Single Bounce Horizontal ATR accessories taken into consideration by the skilled person at the priority date.

4.5 The SpeculATR accessory is not suitable to determine the absorbance ratio of the polymer beads of the opposed patent. More specifically, it is stated on page 2 of the on-screen user manual of the SpeculATR accessory E25 that the pressure device of this accessory is not to be used for samples which have an uneven surface. Similarly, on page 3 of E25, it is stated that the surface of the sample must be completely flat on both sides, a condition which is not met by the polymer beads.

The Thunderdome accessory, on the other hand, can be used for polymer beads, as evidenced by E14 (fifth line from the bottom of the item "Thermo Scientific Spectra-Tech Foundation Thunderdome" on the third page).

Of the two Single Bounce Horizontal ATR accessories available, the skilled person would thus have selected the Thunderdome module.

4.6 During opposition proceedings, the respondent (then-opponent) argued that the skilled person trying to measure the absorbance ratio in the opposed patent would have to contend with several variables, in particular as regards the type of crystal, the incidence angle and the pressure to be applied to press the sample against the crystal (hereinafter referred to as the "measurement pressure") and as a result would not be able to determine the absorbance ratio in an unambiguous manner.

However, the alleged variables do not exist when the MAGNA560 spectrometer is used together with the Thunderdome accessory in order to determine the absorbance ratio in the opposed patent:

4.6.1 According to E14 ("Specifications" in the right-hand column on the third page) and E15 (last paragraph on page 1), the Thunderdome accessory utilises a Germanium ATR crystal. There is thus no variable as regards the type of ATR crystal.

4.6.2 According to E15 (left-hand column on page 2), the crystal face angle in the Thunderdome accessory, which is identical to the angle of incidence (see the formula on page 5 of E5), is approximately 45°. Hence, there is no variable as regards the angle of incidence either.

4.6.3 According to E14, the sample is pressed to the ATR crystal of the Thunderdome accessory by means of a slipping-clutch pressure device (right-hand column on the third page of E14). According to E15 (item "Apply pressure" on page 10 of E15), pressure is increased in the Thunderdome accessory until an audible click is heard, at which point there is maximum pressure.

Consequently, the measurement pressure is inherent to the pressure device of the Thunderdome accessory, and there is no variable in this respect.

This would hold true even if the measurement pressure were not an inherent feature of the pressure device of the Thunderdome accessory. More specifically, it is shown by E11 (table 1 on the second page) that, from a certain measurement pressure onwards, the absorbance ratio essentially stays constant, and it would be part of the skilled person's common general knowledge to carry out the measurement when the absorbance ratio is constant. This is confirmed by the instruction given in the manual E26 on one time reflection type ATR, namely that the measurement pressure has to be increased by lowering a press until the peak intensity becomes stable. Hence, even if the measurement pressure were not inherent to the pressure device of the Thunderdome accessory, the skilled person would still know which measurement pressure to apply, and thus would still not have to contend with any variable.

4.7 In summary, the skilled person wanting to determine the absorbance ratio in the patent would use the MAGNA560 spectrometer in combination with the Thunderdome accessory, and by doing so would not be confronted with any variables. There is thus no ambiguity as regards the absorbance ratio. If there is no ambiguity, it cannot cause any insufficiency. Therefore, the board does not see any reason to deny sufficiency of disclosure for the invention underlying the claims of the main request.

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 for further prosecution on the basis of claims 1 to 18 submitted as main request with letter dated 29 March 2011.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated