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**Datasheet for the decision
of 7 April 2020**

Case Number: T 0218/17 - 3.2.04

Application Number: 06021304.8

Publication Number: 1911352

IPC: A22C13/00, B32B1/08, B32B27/20,
B32B5/18

Language of the proceedings: EN

Title of invention:

Food casings capable of transferring a functional additive from a porous inner layer onto an encased food product

Patent Proprietor:

Kalle GmbH

Opponent:

Viscofan, S.A.

Headword:

Relevant legal provisions:

EPC Art. 100(b), 83

Keyword:

Grounds for opposition - insufficiency of disclosure (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0218/17 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 7 April 2020

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 11 November
2016 revoking European patent No. 1911352
pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman A. de Vries
Members: J. Wright
W. Van der Eijk

Summary of Facts and Submissions

- I. The appeal was filed by the appellant (patent proprietor) against the decision of the opposition division to revoke the patent in suit (in the following, "the patent").

During the opposition proceedings, the opponent inter alia raised the ground for opposition under Article 100(b) EPC (insufficiency of disclosure).

- II. The opposition division decided 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.

- III. The Board issued a summons to oral proceedings. In a communication in preparation for these oral proceedings it gave a preliminary opinion on the question of sufficiency, further indicating that it would be inclined to remit the case for further prosecution.

Due to the measures taken in connection with the COVID 19 crisis the Board cancelled the oral proceedings.

In a letter of 24 March 2020 the appellant-proprietor subsequently withdrew its request for oral proceedings.

- IV. The appellant-proprietor requests that the decision under appeal be set aside and that the patent be maintained according to the main request (as granted) or alternatively, in accordance with one of auxiliary requests I and II, both filed with the grounds of appeal.

The respondent opponent requests dismissal of the appeal as well as requesting oral proceedings.

Both parties request remittal for further prosecution.

V. The independent claim 1 of the main request reads as follows:

"1. A multilayered coextruded stretched thermoplastic food casing comprising:
at least one porous inner layer, wherein the porosity of the porous inner layer has been at least partially generated by stretching of the coextruded casing, wherein the porosity as measured as indicated herein of the sum of all porous inner layers is in the range from 5 to 70 % by volume, and at least an innermost porous inner layer has an interconnected porosity, such that said innermost porous inner layer is able to absorb, retain, desorb and to transfer at least one transferable functional additive from said at least one porous inner layer to food encased in said casing, at least one layer having a barrier effect for water vapor, at least one layer having adhesion properties, said layer having adhesion properties optionally being the same as or different from said porous inner layer and/or said layer having barrier effect for water vapor".

Claim 1 of the first auxiliary request reads as for the main request except that the wording "wherein the porosity is measured as indicated herein" is deleted.

Claim 1 of the second auxiliary request reads as claim 1 of the first auxiliary request except that at the end of the claim the following wording is added:

"wherein said at least one porous inner layer comprises at least one fine-grained filler and wherein the porous inner layer comprises pore channels having diameters in the range from 0.1 to 80 μm ".

VI. In the present decision, reference is made to the following documents:

D6 : R. Ziel *et al*, "Quantification of the pore size distribution (porosity profiles) in microfiltration membranes by SEM, TEM and computer image analysis", *Journal of Membrane Science*, 2008, pages 241 to 246

D7 : Wikipedia article on porosity, last edited on 13 October 2015, filed on 26 October 2015.

D10a to D10c: SEM photographs of casings according to the invention at different scales, filed with letter of 26 October 2015.

D11: Manuel del Cerro *et al* "Volume determination under the microscope, the simple way: The Delesse principle" *Micscape Magazine* 2009.

D12: Laura Espinal "Porosity and its measurement" *Characterization of materials*, edited by E. N. Kaufmann, Wiley, 12 October 2012.

D18: Wikipedia article "Scanning electron microscope", last edited on 19 December 2019, filed on 23 January 2020.

VII. The appellant-proprietor's arguments can be summarised as follows:

The porosity of the layers is to be measured using a scanning electron microscope (SEM) or SEM photographs. At the priority date the skilled person was able to measure porosity taking into account pores of all sizes, not just those said to be detectable in D12 figure 6, because SEMs have adjustable magnification over a much wider range. Furthermore, by stitching images to make a composite image, larger structures can be detected at a high magnification. Therefore the invention as claimed in claim 1 is sufficiently disclosed.

VIII. The respondent-opponent's arguments can be summarised as follows:

The invention cannot be carried out. According to D12, figure 6, only pores up to 10µm can be detected by SEM. Larger pores, which make a significant contribution to total porosity in food casings as those claimed, can not be detected. Therefore, at the priority date, the skilled person would not be able to measure porosity of the casings and the invention is not sufficiently disclosed.

Reasons for the Decision

1. The appeal is admissible.
2. Background

The invention relates to synthetic food casings. In particular, the invention relates to multi-layered coextruded stretched thermoplastic food casings of which at least one is a porous inner layer. The surfaces of the hollow spaces and pore channels may be able to absorb additives, store them and transfer them to the food product (see the published patent specification, paragraph [0001]).

Claim 1 in all its versions defines a range of [total] porosity of the sum of all porous inner layers, expressed as a percentage. The patent (see published patent specification, paragraph [0037]) discloses to measure this total porosity on cross sections of casings using a scanning electron microscope (SEM) or SEM photographs.

3. Main request, claim 1, sufficiency of disclosure
 - 3.1 In its communication dated 12 September 2019, section 2, the Board set out its preliminary opinion regarding this matter. The relevant section of the opinion is reproduced below:

2. Sufficiency of disclosure, main request, claim 1, Article 100(b) EPC

2.1 According to established jurisprudence, an invention sufficiently disclosed if the skilled person, based the application as a whole and using their general knowledge, can perform the invention in the whole claimed, see the Case Law of the Boards of Appeal the EPO, 8th edition, 2016 (CLBA) II.C.

2.2 The appellant-proprietor challenges the impugned decision's finding that the invention as claimed is insufficiently disclosed. The decision found, amongst other things, that the skilled person would not be able to measure the porosity of the sum of all porous inner layers, and so would not be able to carry out the invention. The appellant-proprietor argues that the patent itself contains enough information for the skilled person to be able to measure the porosity, in particular by means of a scanning electron microscope (SEM), as the patent explains.

2.3 It is not in dispute (see D7) that porosity of a material is defined as the volume of voids divided by the total volume, and can be expressed as a percentage. Nor, by the same token, would porosity appear to be an unusual way of characterising a porous material as claimed.

2.4 The patent explains (see page 7, lines 2 to 3) that pores in the food casing material can be closed pores or open channels. The total porosity is the sum of this closed and interconnected porosity. Indeed, since both closed pores and channels are voids, the skilled person would know that both should contribute to the total porosity according to the above definition.

2.5 The patent explains (see published patent specification, paragraph [0037]), that "the porosity of

the different layers may be measured on cross-sections of casings or films prepared with a cryo-microtome. The measurements of the (total) porosity may be performed under a scanning electron microscope (SEM) or on SEM photographs, e.g. with the aid of measurement lines counting the number of points or measurement lengths for the porosity in relation to the total number of points respectively length of the total measurement length."

2.6 In the Board's view, this statement gives the skilled person a clear indication that they can measure total porosity using an SEM, or SEM photographs on a cryo-microtome sample, whether or not other methods might also be usable to measure the total porosity. In this respect, the Board notes that, according to established jurisprudence (see CLBA, II.C.4.2, and the cases cited), an invention is in principle sufficiently disclosed if at least one way enabling the skilled person to carry out the invention is clearly indicated.

2.7 Although the opposition division correctly noted (impugned decision, page 6, last but one paragraph, last sentence) that the SEM and mercury pressure penetration techniques will give different values of porosity, the Board does not agree that the skilled person merely learns from the patent that there are two alternative ways of measuring porosity.

According to the patent (see published patent specification, page 7, lines 5 to 7 and paragraph [0098]), the interconnected porosity can be measured by the mercury pressure penetration method. In the Board's view, the skilled person understands from this that the mercury penetration method measures only the contribution to the total porosity due to open

channels, independently of the porosity due to closed pores.

With this in mind, far from the skilled person being at a loss to decide which porosity measurement (SEM or mercury penetration) explained in the patent they should use to measure porosity of the sum of all layers (total porosity), they would use the SEM method.

2.8 It appears not to be in dispute that the skilled person knows that the volumetric fraction of a discrete distributed component in a three dimensional composite can be accurately calculated from the (microscopically measured) area of the component in the composite's cross section (cf. D11, pages 4 to 7, "volume estimates under the microscope").

2.9 The question however arises as to whether, at the priority date, the SEM method would have been able to measure the area of the pores in the porous inner layers claimed, allowing the porosity of the sum of all porous inner layers to be calculated, with sufficient accuracy.

2.9.1 Regarding this question, the parties have referred to D6 (quantification of the pore size distribution in microfiltration membranes). Although D6 is post-published, the parties appear not to dispute that this reflects the skilled person's general knowledge at the priority date of the patent. Nor does the Board see any reason to doubt that this is so.

2.9.2 The respondent-opponent has argued, with reference to D6, introduction, that only qualitative information on pores could be obtained from SEM methods at the priority date of the patent.

2.9.3 Whether or not the microfiltration membranes described in D6 are structurally similar to thermoplastic food casings as claimed, D6 (see introduction, first paragraph) states that SEM is "a widely used technique to provide direct and detailed structural information including the shape and size of individual pores inside the membrane and at the membrane surface" [emphasis added by the Board]. Furthermore, the Board has no reason to doubt that, at the relevant date, the skilled person was not aware of computer image analysis from their general knowledge, as discussed in D6 (see abstract). Thus, D6 appears to confirm what the patent discloses (see paragraph [0036] again): namely that, at the priority date, the skilled person was able to derive quantitative information about a membrane's porosity using an SEM technique (as well as being able to deriving qualitative information about pores in a membrane).

2.9.4 A further question arising is whether the pores in a thermoplastic food casing are of a size which can be measured using an SEM technique. In its grounds of appeal (page 4, first paragraph), the appellant-proprietor explains that very small pores (the Board infers those to be smaller than 2nm, corresponding to the smallest pores in the mesopore range) cannot be detected (cf. post published D12, section starting on page 5, right hand column, titled "microscopy"). It may therefore need to be considered whether smaller (non measurable pores) would significantly contribute to the porosity of a casing as claimed. In this respect, the Board notes that the smallest pore diameters mentioned in the patent (see paragraph [0036], 0.01 μ m), are 10nm, thus five times larger than 2nm. In its reply to the appeal (see page 5, second paragraph), the respondent-

opponent asserts that it is common knowledge that thermoplastic food casing comprise micropores (size less than 2nm), this they appear to argue is proven by D7, page 4. D7 is a Wikipedia article about porosity. However, it does not mention food casings, let alone offer a characterisation of pores in food casings. The fact that on page 4 it is stated that, in solids, microporosity refers to pores smaller than 2nm, does not, in the board's view, prove that these are normally present in food casings, much less demonstrate that such pores might significantly contribute to their total porosity as the respondent-opponent has speculated.

2.9.5 The respondent-opponent also argues (reply to appeal, page 5, third paragraph) that D12, figure 6 demonstrates that the SEM method cannot be used to measure pore diameters greater than 10 μ m (10000nm). Similarly, the appellant-proprietor argues (see grounds of appeal, page 4, first paragraph) that pores that are "too large" to be measured by the SEM method do not, according to the patent, contribute to the total porosity. It may need to be discussed what pore diameter would be "too large".

In this respect, the appellant-proprietor appears to argue that any pores above this upper limit of SEM detection should simply be considered as not contributing to the total porosity.

2.9.6 If indeed the upper limit of pore diameter the skilled person can measure (too large) is around 10 μ m, it seems (cf. published patent specification, paragraph [0036] again) that many pores in a food casing would not be measurable, although they would inevitably make a significant contribution to the actual total

porosity. In the Board's view, ignoring all pores larger than a certain limit, say 10µm, would mean that the skilled person would never know whether the porosity they had calculated corresponded in any way to the actual porosity of the casing.

In the Board's view, this could but lead to the conclusion that the invention could not be carried out by the skilled person. In other words that the invention as claimed is not sufficiently disclosed.

Therefore, exploring this point appears to be crucial in deciding whether or not the invention as claimed in claim 1 is sufficiently disclosed".

- 3.2 In the concluding two points of this section of the communication (2.9.5 and 2.9.6), the Board identified an important question for deciding on the issue of sufficiency of disclosure. The Board summarises this question as follows: Is the skilled person, at the priority date, able to measure sum porosity of casing layers, including contributions of those pores with a diameter between 10 and 200µm, using SEM detection [or using SEM photographs]?
- 3.3 Taking into account the written submissions of the parties, including those subsequent to the communication, the Board considers that this question must be answered in the negative. Therefore the subject matter of claim 1 is insufficiently disclosed. The reasons are as follows.
- 3.4 The appellant-proprietor has replied to this question in a letter of 22 January 2020 (see page 3). It argued that, in SEM detection the magnification factor can be varied over a wide range, the range in D12, figure 6

being only a preferred range. To support this statement the appellant proprietor cited D18 (page 7 "magnification"), which states that SEM magnification varies between 1:10 up to 1: 3000000.

- 3.4.1 Assuming that post published D18 indeed reflects common general knowledge regarding SEM at the date of priority, the appellant-proprietor's argument that SEM magnification can be adjusted as disclosed in D18 has not convinced the Board that the skilled person would be able to measure porosity of each layer using SEM, taking into account the contribution of pores greater than 10 μ m.
- 3.4.2 As the respondent-opponent has pointed out (see letter of 24 February 2020), D12, figure 6, does not show a magnification range. It shows the range of pore sizes which can be detected by SEM (2nm to 10 μ m). Only a small proportion of possible pore sizes found in a typical casing according to the invention overlap with this band and would thus be detectable. For example (see published patent specification, paragraph [0036]), pores can range between 0.01 μ m (10nm) and 20000 times larger at 200 μ m. Whilst the smallest pores would be detectable according to D12, figure 6, the larger ones would not.
- 3.4.3 Moreover, the appellant proprietor has not provided any information on how magnification range relates to detectable pore size range. In the Board's view, as well as magnification, other factors, such as resolution and field of view also determine the range of pore size that SEM can measure.
- 3.4.4 Therefore, in the Board's view, being able to adjust the magnification range of an SEM as D18 suggests does

not prove that all the pores of the sizes typically present in casings as claimed, and their contribution to the total porosity, would be detectable. Consequently, it is not proven that it would be possible to calculate the total porosity of a layer by simply viewing it using SEM or SEM photographs.

- 3.5 As with D18, the differently scaled SEM photographs D10a to D10c are not prior art. They are said to represent SEM photographs of casings according to the invention at different scales, and showing pore size between 0.1 μm and about 20 μm . However, because they do not show smaller or bigger pores, this does not demonstrate that such pores are absent, but could merely confirm the known limits of SEM in detecting larger or smaller pore size.
- 3.6 Nor does the Board come to a different view in the light of the appellant-proprietor's further argument, according to which, to display larger structures in stronger magnification, it is known to change the position of the object in the microscope and then combine individually derived images by what it refers to as "stitching", to form a complete image.
- 3.6.1 The Board acknowledges that this stitching-together of multiple images would, in effect, increase the field of view. This might well allow more pores, including larger ones, to be displayed and their contribution to total porosity measured, whilst still being able to measure the smaller ones. However, this "stitching" method is not mentioned in the patent itself, which merely discloses (paragraph [0037]) to measure, for example with the aid of measurement lines, under an SEM or on SEM photographs.

3.6.2 Moreover, the appellant-proprietor has not provided any evidence that might have convinced the Board that such a "stitching" method was generally known to the skilled person at the priority date of the patent. Therefore, the argument that, at the priority date, the skilled person can carry out the invention by applying this method is moot.

3.7 Furthermore, the Board notes that as is clear from paragraph [0036] of the patent, pores over 10 μ m form an important part of distribution of pore sizes of pores of the porous inner layers of the food casing. Thus, d_{95} is preferably in the range 10 to 350 μ m, with the average d_{50} preferably between 0.1 and 50 μ m. Clearly, the contribution of such large size pores to the pore distribution is not negligible such that a SEM measurement might have produced a representative value of sum porosity. Indeed the respondent opponent's calculations, page 4 of their reply of 24 February 2020, show that for typical values of d_{50} and d_{95} SEM would be unable to measure the majority of pore sizes. Thus it cannot provide a reliable measure of sum porosity. As the patent does not otherwise indicate how this definitive parameter of the porous inner layer of the claimed food casing is to be measured, the claimed invention is not sufficiently disclosed.

3.8 Finally, the Board is unconvinced by the respondent's argument that claimed total porosity is to be understood as only the volume of pores that can be determined by SEM. This argument contradicts their earlier argument in relation to D18 and D10 that SEM can measure total porosity across the whole range of pore sizes. Moreover, it conflicts with the significant contribution of large pores to the distribution of pore

sizes as can be inferred from specification paragraph [0036] discussed above.

3.9 The Board concludes that the arguments presented by the appellant-proprietor have not convinced the Board that the invention according to claim 1 is sufficiently disclosed. Therefore this request must fail.

4. Auxiliary requests.

4.1 The Board informed the parties of its preliminary opinion (see communication of 12 September 2019, section 3) that the issue of sufficiency of disclosure as discussed for the main request also applied to the auxiliary requests since, also in these requests, the skilled person needed to be able to make a casing having a porosity in the range of 5% to 70%.

4.2 The appellant-proprietor has not provided any argument as to why the auxiliary requests should succeed if the main request were to fail. Nor does the Board see any reason to deviate from its preliminary opinion. Therefore, the Board concludes that claim 1 of the auxiliary requests fails for the same reasons as apply to the main request.

5. Since the invention according to claim 1 of all the requests is insufficiently disclosed, the Board must dismiss the appeal.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



G. Magouliotis

A. de Vries

Decision electronically authenticated