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**Datasheet for the decision
of 13 August 2018**

Case Number: T 0666/15 - 3.3.09

Application Number: 06848930.1

Publication Number: 1971216

IPC: A23G4/08

Language of the proceedings: EN

Title of invention:

CHEWING GUM CONTAINING STYRENE-DIENE BLOCK COPOLYMERS

Patent Proprietor:

WM. WRIGLEY JR. COMPANY

Opponent:

Perfetti Van Melle S.p.A.

Headword:

Relevant legal provisions:

EPC Art. 56

RPBA Art. 13(1)

Keyword:

Inventive step - (yes) - non-obvious modification - ex post
facto analysis

Late-filed evidence - admitted (no)

Decisions cited:

Catchword:



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Case Number: T 0666/15 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 13 August 2018

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
29 January 2015 concerning maintenance of the
European patent No. 1971216 in amended form.**

Composition of the Board:

Chairman W. Sieber
Members: A. Veronese
D. Prietzel-Funk

Summary of Facts and Submissions

- I. This decision concerns the appeal filed by the opponent against the interlocutory decision of the opposition division that European patent No. 1 971 216 as amended meets the requirements of the EPC.
- II. With its notice of opposition, the opponent had requested the revocation of the patent in its entirety on the grounds under Article 100(a) EPC (lack of novelty and inventive step).
- III. The documents submitted during the opposition proceedings included:
 - D2: EP 5 093 136
 - D4: US 4 963 369
 - D5: Encyclopedia of Polymer Science and Engineering; 1985; Vol. 2; Entry "Block Copolymers", section "Applications"
- IV. In its decision, the opposition division decided that the subject-matter of claims 1 and 14 of the granted patent lacked novelty in view of D4, but that the auxiliary request, based on a set of claims filed during the oral proceedings, was allowable.
- V. This decision was appealed by the opponent (hereinafter: the appellant), which requested that the decision of the opposition division be set aside and that the patent be revoked in its entirety.
- VI. The proprietor (hereinafter: the respondent) did not appeal the decision. However, in its reply to the statement setting out the grounds of appeal, it requested that the decision of the opposition division

be set aside and that the patent be maintained as granted or alternatively on the basis of a first auxiliary request filed with that reply. As a second auxiliary request, it requested that the claims as allowed by the opposition division be maintained.

- VII. In a communication issued in preparation for the oral proceedings, the board drew attention to the points to be discussed in the context of the inventive-step objection. The board also expressed the preliminary opinion that the main and first auxiliary requests were inadmissible (*reformatio in peius*).
- VIII. With a letter dated 13 July 2018, the respondent replaced the requests on file with a new main request and five auxiliary requests. Further arguments were presented addressing the inventive-step objection and reference was made to an additional document:
"Formulation and Production of Chewing and Bubble Gum, D. Fritz, First edition, 2006, pages 98-100"
- IX. On 13 August 2018 oral proceedings took place before the board. During the oral proceedings the respondent withdrew the main request and filed a copy of the document mentioned in the letter dated 13 July 2018 (hereinafter: D9). It conceded, however, that this copy was the second edition of D9 and not the first one, which was mentioned in that letter. The appellant requested that D9 not be admitted into the proceedings. At the end of the oral proceedings the chairman announced the decision.
- X. Independent claims 1, 8, 12 and 13 of the first auxiliary request read as follows:

"1. A chewing gum base for use in a chewing gum, the chewing gum base comprising:
an elastomer, wherein said elastomer comprises a styrene-diene block copolymer; and an elastomer plasticizer, wherein the elastomer comprises a mixture of a styrene-diene block copolymer and a second elastomer and wherein the styrene-diene block copolymer is present in the elastomer at a concentration of from about 75 weight percent to about 99 weight percent, based on the total weight of the elastomer."

"8. A continuous process for making chewing gum base, wherein all addition and compounding steps are performed using a single continuous mixing apparatus, comprising: adding to a single extruder all of a group of components to make a desired chewing gum base including an elastomer, wherein said elastomer comprises a styrene-diene block copolymer; and an elastomer plasticizer, wherein the elastomer comprises a mixture of a styrene-diene block copolymer and a second elastomer and wherein the styrene-diene block copolymer is present in the elastomer at a concentration of from about 75 weight percent to about 99 weight percent, based on the total weight of the elastomer, wherein the elastomer is added to the extruder separate and apart from the elastomer plasticizer;
providing at least two mixing zones in the extruder/
and producing chewing gum base from the single extruder."

"12. A chewing gum comprising: a water soluble gum portion; and a water insoluble base portion, wherein said base portion comprises a gum base as defined in any one of claims 1 to 7."

"13. Use of a styrene-diene block copolymer as an elastomer for a gum base according to any one of claims 1 to 7."

XI. The first auxiliary request essentially corresponds to the auxiliary request held allowable by the opposition division ("Annex 3" of the appealed interlocutory decision). However, some amendments to the wording have been made, including: the deletion of a repetition of the phrase "a water insoluble base portion" in claim 12 and the re-introduction of the word "block" omitted, apparently inadvertently, from claim 13 (this word was present in corresponding granted claim 15).

XII. The arguments of the appellant relevant for the present decision were as follows:

Document D2 was the closest prior art for assessing inventive step. This document addressed, like the opposed patent, the technical challenges arising when using styrene-butadiene polymers in the manufacture of chewing gum bases. To overcome these challenges, D2 proposed blending a styrene-butadiene random copolymer with a polyisobutylene elastomer. Starting from D2, which did not mention block copolymers, the objective technical problem underlying the claimed invention was how to provide an alternative gum base overcoming the problems associated with the use of styrene-butadiene random polymers. The proposed solution, which involved the use of styrene-butadiene block copolymers, rather than styrene-butadiene random copolymers and polyisobutylene elastomers was obvious, as it was suggested in D4 and D5. Although not in the field of food processing, D5 was a textbook representing common general knowledge which disclosed the advantages, in terms of processing and costs, of using styrene-

butadiene block copolymers. D4 disclosed chewing gums having a gum base comprising crack resistant beads made of the relevant block polymers. This confirmed that these polymers had elastomeric properties and that they could be used in food. When searching for an alternative to the elastomers disclosed in D2, taking into account the teaching of D4 and D5, the skilled person would have expected styrene-butadiene block copolymers to be at least as suitable as those disclosed in the prior art. The patent did not report evidence that the use of block copolymers was associated with any unexpected technical effect. Furthermore, no comparisons with the closest prior art were reported. Thus, the proposed solution did not involve an inventive step over the prior art.

XIII. The arguments of the respondent relevant for the present decision were as follows:

Document D2 was the closest prior art. The claimed invention differed from the teaching of D2 in that it involved the use of styrene-butadiene block copolymers. The results reported in the patent indicated that, by using block copolymers instead of random copolymers, the time needed to manufacture a gum base could be reduced and that gums having harder initial bite and improved bubbling properties could be produced. Although no direct comparisons were made with the closest prior art, both the patent and D2 reported comparisons with reference compositions comprising only a styrene-butadiene random copolymer. Relying on the teaching of D2, alone or in combination with the other available documents, the skilled person could not expect the relevant block copolymers to overcome the difficulties associated with the manufacture of a gum base, let alone that chewing gums

having acceptable chewing and bubble-blowing properties could be produced. This required the use of elastomers having a particular balance between plastic and elastomeric properties. A chewing gum had to conform to the teeth when chewed, be easily stretched, torn apart and reform repeatedly. D5 was completely silent as to chewing gum manufacture. This document related to completely different technical fields and applications, such as footwear, bitumen modification, adhesive and cable insulation. As to D4, the block copolymers described in this document were cross-linked and therefore not suitable for the invention. Furthermore, these block copolymers were not part of the gum base of a chewing gum. In fact, they were included in structurally distinguished beads, loaded with and controlling the release of an active agent. Finally, as indicated in D9, despite the fact that many synthetic rubber polymers were known, only few were suitable and approved for use in chewing gums. For these reasons, starting from D2, irrespectively of whether the underlying problem was the provision of an alternative or an improved gum base, the proposed solution involved an inventive step.

Reasons for the Decision

First auxiliary request

1. The main request having been withdrawn, the first auxiliary request is the highest-ranking request on file.
2. *Inventive step*
 - 2.1 The invention claimed in the opposed patent relates to a chewing gum composition having a gum base containing

a styrene-diene block copolymer. According to what is reported in paragraph [0007] of the patent, styrene-diene block polymers are particularly suitable for manufacturing the gum base of chewing gums. The advantages associated with the use of the specified block copolymers, as opposed to random styrene diene copolymers for example, are believed to stem from their ability to behave like a cross-linked elastic rubber at room temperature and as a thermoplastic at a higher temperature (paragraph [0015]). The patent reports the preparation of different gum bases and chewing gums comprising styrene-diene block copolymers in paragraphs [0051-0060].

- 2.2 Like the opposed patent, document D2 relates to the preparation of a chewing gum composition and discusses the challenges associated with the manufacture of gum bases comprising styrene-butadiene random copolymers. In column 2, lines 32-37, D2 states that bubble gum bases from styrene-butadiene (random) copolymers are difficult to process because they are sticky, stringy and too elastic. In order to improve their processing, as well as the quality and initial chew characteristics, D2 proposes blending the styrene-butadiene gum base with a polyisobutylene gum base (column 2, lines 50-62; claims; examples).
- 2.3 The board concurs with both parties that D2 is the closest state of the art to start from in the assessment of inventive step, since it addresses, like the opposed patent, the problems associated with the manufacture of chewing gums having a gum base comprising styrene-butadiene random copolymers. The use of styrene-butadiene block copolymers is not mentioned in D2.

- 2.4 The experimental section of the patent describes the preparation of gum bases comprising styrene-butadiene block copolymers and comparative formulations comprising styrene-butadiene random copolymers. As reported in paragraphs [0053-0058], chewing gums can be manufactured effectively using the block copolymers. These chewing gums have an adequate chewing profile and in some cases also an excellent bubble capacity. The tested gums and chewing gums contain only one elastomer, namely a styrene-diene block copolymer. It is plausible, however, to assume that similar results would be obtained if, as requested in the claims, a minor amount of a second elastomer were present in the composition.
- 2.5 Starting from the teaching of D2 as the closest prior art, and taking into account the results presented in the patent, the underlying objective technical problem can be seen as the provision of a further gum base and of a chewing gum comprising said base which has adequate chewing properties, and the provision of a process for manufacturing said products in an effective manner.
- 2.6 In this context it is worth noting that there is no technical evidence on file confirming that, as stated by the respondent, the use of block copolymers, rather than random copolymers, is associated with an improvement in the processing properties of the gum base. Paragraph [0053] reports a decrease in mixing time, but also concedes that the block and the random polymers were added in different forms (pellets or blocks) and that the effect of this difference is still to be quantified. Moreover, the patent does not report any test comparing products prepared using styrene-butadiene block copolymers with the products described

in the closest prior art document D2. For these reasons, the technical problem is to be formulated as the provision of an alternative (i.e. further), rather than an improved, product and/or method for manufacturing said product.

- 2.7 The question to be answered is whether the skilled person, confronted with the underlying technical problem, would have considered replacing entirely, or at least to a large extent, the random copolymers used to manufacture the gum bases disclosed in D2 with styrene-diene block copolymers.
- 2.8 D2 itself does not mention styrene-diene block copolymers. However, according to the appellant, the skilled person would have considered using these polymers, taking into account the teaching of documents D4 and D5.
- 2.9 D5 is an extract from an encyclopedia of polymer science dealing with block polymers having thermoplastic elastomeric properties. Table 13 lists, among other block polymers, styrene-diene copolymers. These are said to be thermoplastic elastomers which can be used to produce moulded products such as adhesives, films, footwear, gaskets, cable insulations: see page 398 Table 13, column "Typical applications", and page 399, last full paragraph. D5 further teaches that the primary advantages of thermoplastic elastomers include easy processing with standard thermoplastic equipment, low processing costs and a "large variety of thermal, rheological and mechanical properties".
- 2.10 These statements are of a very general nature. In particular, D5 is completely silent as far as the manufacture of a chewable product is concerned. The

board concurs with the respondent that, relying on D5, the skilled person would not be able to predict the suitability of styrene-diene block copolymers for the manufacturing of a gum base, let alone predict the chewability of a chewing gum comprising said base. As noted by the respondent, the gum base present in a chewing gum must conform to the teeth when chewed and be easily stretched, torn apart and reformed repeatedly. Products having these properties are not mentioned in D5. Thus, this document would not provide the skilled person with any hint on how to solve the technical problem underlying the claimed invention.

2.11 D4 describes chewing gums comprising polymeric beads having microporous passages impregnated with an active agent, e.g. a sweetener or a flavour. The beads are so designed as to control the release of the active ingredient. The chewing gum described in example VI contains beads comprising styrene-butadiene block copolymers. These beads are said to be crack-resistant. According to the appellant, D4 confirmed that the relevant block copolymers possess elastomeric properties and that they can be used in the manufacture of chewing gums. This would then lead the skilled person to use said polymers for manufacturing the gum base of a chewing gum.

2.12 The board cannot accept this argument. The beads described in D4 are crack resistant, but must also maintain their structural integrity during the chewing process, in order to control the release of the active agent contained in them. In this respect, the properties of the material making up the beads differ substantially from those of the gum base of a chewing gum, which have already been mentioned above. It is also noted that the styrene-butadiene block copolymer

contained in the beads is cross-linked by a copolymerisation process involving the use of styrene and divinylbenzene monomers. There is no evidence at hand, and it also seems unlikely, that a material made up of a cross-linked polymer can be torn apart and then reformed.

2.13 Furthermore, although the beads described in D4 are dispersed within a gum base, a skilled person would not have considered them to be part of said base, i.e. of the component of a chewing gum giving it chewability. This is confirmed by the introductory part of D4 (column 1, lines 13-15), which acknowledges that a chewing gum includes a "tasteless masticatory chewing gum base" and a non-masticatory component including the active ingredient. The beads described in D4 are mixed with the "masticatory chewing base" but remain dispersed in it, as separate discrete particles. Neither an explicit nor an implicit teaching can be found in D4 that these beads become effectively part of the gum base contributing to the chewability of the chewing gum. For these reasons, document D4 does not provide any information which could be relevant for the skilled person seeking to solve the underlying technical problem.

2.14 For these reasons, the board concludes that, starting from D2 as the closest prior art, the skilled person would not, without hindsight, have taken into consideration the teaching of D4 and/or D5 when confronted with the underlying technical problem. Accordingly, they would not have prepared a gum base and a corresponding chewing gum as described in claims 1-7 and 12. For the same reasons, they would not have carried out a process for making a chewing gum comprising the use of styrene-diene block copolymers as

defined in claims 8-11 or used said copolymers in the manner described in claim 13. As a consequence, the subject-matter of the first auxiliary request involves an inventive step.

3. *Document D9*

3.1 D9 is an excerpt from a textbook which was first mentioned by the respondent in its letter dated 13 July 2018. A copy of this document was only filed during the oral proceedings. According to the respondent, D9 proved that, although many synthetic rubbers were known to the skilled person at the relevant date, only a few were considered suitable for producing a gum base for a chewing gum. The board noted that the letter referred to the first edition of D9, published in 2006, whereas the copy provided at the oral proceedings stemmed from the second edition, published in 2008, which is well after the filing date of the application from which the opposed patent derives. However, it is not possible to determine from D9 alone whether the information disclosed in the second edition was already in the first one. But even if it had been the case, the first edition of D9 was published between the priority date and the filing date of the application for the opposed patent. This raised new questions as to the validity of the priority date and/or which part of D9 could be considered to belong to the state of the art according to Article 54(2) EPC. These issues had not been addressed before, and neither the board nor the appellant could be expected to deal with them at such a late stage of the proceedings. Accordingly, D9 was not admitted into the appeal proceedings under Rule 13(1) RPBA.

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 in the following version:
 - claims 1 to 13 filed as the first auxiliary request with the letter dated 13 July 2018 and
 - pages 1 to 13 of the description filed on 13 November 2014 during the oral proceedings before the opposition division.

The Registrar:

The Chairman:



M. Cañueto Carbajo

W. Sieber

Decision electronically authenticated