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**Datasheet for the decision
of 24 January 2014**

Case Number: T 1556/10 - 3.3.09

Application Number: 95301643.3

Publication Number: 732058

IPC: A23G4/00

Language of the proceedings: EN

Title of invention:

Continuous gum base manufacture using paddle mixing and apparatus therefor

Patent Proprietor:

WM. WRIGLEY JR. COMPANY

Opponent:

Cadbury Schweppes Plc

Headword:

Relevant legal provisions:

EPC Art. 56

Keyword:

Inventive step - (no)

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
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Case Number: T 1556/10 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 24 January 2014

Appellant: Cadbury Schweppes Plc
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
6 May 2010 concerning maintenance of the
European Patent No. 732058 in amended form.**

Composition of the Board:

Chairman: W. Sieber
Members: N. Perakis
R. Menapace

Summary of Facts and Submissions

I. Mention of the grant of European patent No. 0 732 058 in the name of WM. Wrigley Jr. Company was published on 9 June 2004 (Bulletin 2004/24). The patent was granted with 41 claims. Claims 1-27 related to a continuous method of making chewing gum base, and claims 28-41 related to a chewing gum base paddle mixer for use in continuously manufacturing chewing gum base. Independent claim 1 reads as follows:

"1. A continuous method of making chewing gum base, comprising the steps of:

providing a mixer which includes a plurality of kneading elements and conveying elements arranged on one or more shafts, the kneading elements covering at least 30% of one or more shafts for mixers with an L/D ratio greater than 40/1 and at least 40% of one or more shafts for other mixers;

continuously feeding gum base ingredients comprising from 5 to 95 wt% elastomer, from 0 to 75 wt% elastomer plasticizer, from 0.5 to 40 wt% softeners/emulsifiers, and from 1 to 65 wt% fillers/texturizers to the mixer; and continuously blending the ingredients using the kneading elements until a homogeneous gum base is obtained;

wherein the kneading elements comprise mixer paddles which mix the gum ingredients without facilitating significant forward conveyance of the gum ingredients through the mixer."

II. Notice of opposition was filed by Cadbury Schweppes Plc on the grounds that the claimed subject-matter was neither novel nor inventive (Article 100(a) EPC).

The documents submitted included the following:

D1: US 3 618 902 A;
D2: FR 2 635 441 A1;
D2a: Translation of D2 into English; and
D9: EP 0 160 726 A1.

- III. By an interlocutory decision announced orally on 7 April 2010 and issued in writing on 6 May 2010 the opposition division maintained the patent in amended form on the basis of auxiliary request 1, which consisted of granted claims 1-27. The opposition division considered that the subject-matter of these claims was novel over the cited prior art, and involved an inventive step over the disclosure of either D1 or D2, each considered alone or in combination with D9.
- IV. On 14 July 2010 the opponent (hereinafter: the appellant) filed an appeal against the decision of the opposition division and paid the appeal fee on the same day. The statement setting out the grounds of appeal was filed on 26 July 2010, including a copy of D9 (referred to as D3).
- V. By letter dated 24 November 2010 the patent proprietor (hereinafter: the respondent) filed observations on the appeal, and an auxiliary request, which corresponded to auxiliary request 3 filed before the opposition division.

Claim 1 of the auxiliary request reads as follows:

"1. A continuous method of making chewing gum base, comprising the steps of:

providing a mixer which includes a plurality of kneading elements and conveying elements arranged on one or more shafts;
continuously feeding gum base ingredients comprising from 5 to 95 wt% elastomer, from 0 to 75 wt% elastomer plasticizer, from 0.5 to 40 wt% softeners/emulsifiers, and from 1 to 65 wt% fillers/texturizers to the mixer; and continuously blending the ingredients using the kneading elements until a homogeneous gum base is obtained;
wherein **the kneading elements comprise mixer paddles which cover at least 60 percent of the one or more shafts** and which mix the gum ingredients without facilitating significant forward conveyance of the gum ingredients through the mixer."
[difference over claim 1 of the main request in bold]

The respondent requested *inter alia* that the "full reference" D9 not be admitted into the proceedings. Only the cover page of D9 had been filed with the original notice of opposition and had been only briefly referred to in relation to features of dependent claims. The full reference D9 was filed for the first time with the statement of the grounds of appeal, and the use of D9 as possible closest prior art to support a lack of inventive step was again raised for the first time.

- VI. Following the summons to oral proceedings, the respondent withdrew by letter dated 19 November 2013 its request for oral proceedings and announced that it would not be represented at the oral proceedings appointed for 24 January 2014.

- VII. By letter dated 20 December 2013 the appellant likewise withdrew its request for oral proceedings. Furthermore,

it provided additional arguments concerning the admissibility of the full document D9 and the issue of inventive step, which included a reference to a new document D13. This document was filed subsequently with letter dated 8 January 2014:

D13: Directive from the US Food and Drug Administration, Docket No. 99F-2533, dated 9 July 2001.
(cited as D4 by the appellant in the appeal proceedings)

VIII. Oral proceedings were held before the board on 24 January 2014 in the absence of the parties.

IX. The relevant arguments put forward by the appellant in its written submissions may be summarised as follows:

Main request

- Claim 1 does not require a particular amount of mixer paddles, although this is crucial for low shear and long residence time. Furthermore, as no requirement is imposed on the mixing/conveying along the remaining shaft length, high shear mixing is not excluded and the arrangement of multiple pre-blending steps is not avoided. Thus claim 1 does not achieve the alleged effects over its entire scope.
- The subject-matter of claim 1 is obvious in view of the cited prior art and thus lacks inventive step. Any of D1, D2 or D9 could be considered to represent the closest state of the art.

- Regarding D2, it discloses a continuous method for the preparation of a high-polymer-content gum base. The method of claim 1 differs from that of D2 only in that it specifies kneading elements comprising mixer paddles and that the mixer paddles covered at least 30% of one or more shafts for mixers with an L/D ratio greater than 40/1 and at least 40% of one or more shafts for other mixers.
- The respondent's allegation that D2 relates to gum base concentrates rather than to gum base itself is not convincing. The gum base is defined so broadly in claim 1 that it covers a gum base without any elastomer plasticiser. Therefore the gum base of claim 1 could also be considered as a concentrate.
- Contrary to the respondent's allegation, D2 discloses a homogeneous gum base (see D2a: page 2, lines 30-34, and page 3, line 26). Therefore, homogeneity cannot constitute a differentiating technical feature.
- The technical problem in the light of D2 is the provision of an improved method for continuously manufacturing a gum base.
- The skilled person starting from D2 and aiming at solving this technical problem would find in D1 the motivation to use a mixer with paddles, which falls within the definition of the mixer of claim 1 (figures 2 and 5; column 3, lines 38-63; column 5, lines 43-55), in order to achieve a longer residence time and thereby a homogenous mixture of the ingredients.

- D1 does not mention chewing gum base, but it was well-known in the art long before the priority date of the patent in suit that continuous mixing was a good way of making chewing gum base (see patent: paragraphs [0004]-[0005]). As D1 relates to an apparatus and a methodology applicable to a wide variety of materials which obviously include elastomer, it would be consulted by the skilled person seeking to improve the continuous gum base manufacture without requiring any hindsight analysis.

- Furthermore, the skilled person, who would be aware that short residence times in continuous mixing processes are a problem for producing satisfactory homogeneous mixtures (patent paragraph [0004]), would logically try to increase residence times to allow for longer mixing times and have more chance of obtaining homogeneous mixtures. He would therefore consult D1 and would find in it how he could possibly achieve homogeneous mixtures, namely by using mixer paddles in a certain proportion within the mixer. D1 (figures 2 and 5; column 5, lines 49-50; column 3, lines 61-63) discloses that all flat or straight paddles are employed when a very high retention time is envisaged. Therefore the skilled person would obviously combine D1 and D2 and would arrive at the subject-matter of claim 1 without the exercise of any inventive step.

- Further obvious combinations which lead to the claimed subject-matter are those of D1 with D2, D1 with D9 and D9 with D1.

Auxiliary request

- Claim 1 of the auxiliary request corresponds to the combination of granted claims 1 and 2. Claim 1 specifies that the mixer paddles cover at least 60 percent of the one or more shafts.

- This claim also lacks an inventive step for the reasons given for the main request. Particular reference is made to the disclosure of D1 according to which up to 100 percent flat or straight mixing paddles are used in order to achieve a high retention or residence time for the ingredients being mixed. Thus D1 also anticipates the specific feature of claim 1 of the auxiliary request, namely that the mixer paddles cover at least 60 percent of the one or more shafts.

X. The relevant arguments put forward by the respondent in its written submissions may be summarised as follows:

Main request

- The claimed subject-matter involves an inventive step since it is not obvious when considering the cited prior-art documents.

- D2, as correctly identified by the opposition division, is considered to represent the closest prior art. D2 is in the same general technical area as the claimed invention but concerns gum base concentrates.

- Claim 1 is novel over D2 as it does not concern a gum base concentrate and as it requires the use of kneading elements with specific mixer paddles.
- The problem underlying the claimed invention is the provision of an effective chewing gum base, which was a homogeneous gum base. D2 was not particularly concerned with homogeneity because a gum base concentrate would undergo incorporation of the remaining components, and only the finished gum base would require mixing to become homogeneous. Incidentally, D2 disclosed short mixing times which could not impart any degree of homogenisation. Contrary to this, paragraph [0077] and example 1 of the patent in suit disclosed longer mixing times.
- The skilled person starting from D2 and aiming at increasing the residence time of the gum base in the mixer would have no reason to combine its disclosure with that of D1. The arguments of the appellant are based on hindsight and a misreading of D1. In view of the mixing times disclosed, these documents are contradictory and the skilled person would not combine them.
- D1 is a general reference to homogeneous mixing, kneading and blending of a wide variety of materials in fluid, plastic, granular or powdered form (page 1, lines 4-7). Efficient mixing is provided by an arrangement of paddles which results in high shear (abstract). Flat or straight paddles are employed when a very high retention time is required. If D1 were to be combined with D2, then helical paddles should be employed in order to ensure that a low retention time was

provided. This combination is, however, against the requirement of the claimed subject-matter, namely that the kneading elements comprise mixer paddles without facilitating significant forward conveyance of the gum ingredients through the mixer.

- Furthermore, since D1 discloses that it is essential to have high shear, one skilled in the art seeking to avoid high shear would clearly not be motivated to consider anything in this reference.

- Finally, the full reference D9 should not be admitted into the proceedings since it was not filed before the opposition division and no reason was provided for its late filing. D9 is not *prima facie* relevant.

Auxiliary request

- None of the prior-art documents discloses the use of the mixer paddles covering at least 60% of the shafts. Therefore the auxiliary request also involves an inventive step.

XI. The appellant had requested in writing that the decision under appeal be set aside and that European patent No. 0 732 058 be revoked.

XII. The respondent had requested in writing that the appeal be dismissed, or alternatively that the case be remitted with the order to maintain the patent on the basis of the auxiliary request filed with letter of 24 November 2010.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. The closest prior art
 - 2.1 The claimed invention relates to a process for making chewing gum base using a continuous process known as paddle mixing (patent, paragraph [0001]). It is considered to be the result of development in the preparation of chewing gum base.

The chronological evolution of gum base preparation is disclosed in the patent in suit (paragraphs [0002] to [0008]). It is stated therein that chewing gum base was conventionally prepared using a batch mixer, in which the typical ingredients were added sequentially and blended until a homogeneous mass was attained. Although such a batch process operated under conditions of low shear and little or no pressure and produced a well-mixed chewing gum base with little or no degradation of the gum base components, it had the disadvantage of requiring a long mixing time, and not reliably avoiding small but detectable variations in colour, consistency or taste between different batches.

In order to shorten the mixing time and eliminate variations between batches, consideration was given to mixing gum base continuously using twin screw extruders. However, this was difficult to use successfully because the residence time was too short, i.e. of the magnitude of a few minutes. This extreme shortening of residence time made it difficult to

produce a homogeneous gum base without lumps, islands, and other inconsistencies (paragraph [0004]). D2, which discloses a continuous process for the preparation of chewing gum base using a twin screw extruder having a residence time not exceeding 1.5 minutes, belongs to this later development. It is therefore reasonable to consider D2 to represent the closest prior art. This is in agreement with the decision of the opposition division and the arguments of the respondent.

2.2 D2 discloses a process for the preparation of chewing gum base concentrate (page 1, lines 4-6) comprising high molecular weight elastomers, plasticizers, fillers/texturizers (page 3, lines 13-22; page 4, lines 27-37, and page 6, lines 30-38). This process can be carried out continuously (page 5, lines 24-25) using a twin screw extruder (page 3, lines 20-24), which continuously blends the ingredients until a homogeneous base is obtained (page 4, lines 1-2; page 5, lines 15-16).

2.2.1 The chewing gum base of claim 1 is no different from that of D2 (page 6, lines 30-38) in view of the ingredients used and their amounts (%wt):

	Claim 1	D2
elastomer	5-95	30-90
elastomer plasticizer	0-75	- (1)
softener/emulsifier	0.5-40	8-10 ⁽²⁾
filler/texturizer	1-65	5-10

In both cases the essential ingredient is the elastomer. According to claim 1 the elastomer plasticizer is only optional, and can therefore not constitute a technical difference.

(1) The wax-type plasticizer of D2 corresponds to the optional wax ingredient of the patent in suit (see paragraph [0070]) and is different from the elastomer plasticizer of claim 1.

(2) Although the colophony resins are considered in D2 as plasticizers (page 1, lines 18-19; page 4, lines 31-32, and page 6, line 36), they act as softeners in a chewing gum base as corroborated by D13 (page 1, line 3; page 2, lines 6-7). Therefore the colophony resins of D2 correspond to the softener ingredient of claim 1.

Thus, contrary to the respondent's allegation, the chewing gum base of D2 does not differ from the chewing gum base of claim 1 as far as the relevant ingredients are concerned. Hence, the respondent's argument that D2 concerns a gum base concentrate whereas claim 1 concerns a (finalised) chewing gum base is not convincing.

2.2.2 Furthermore, the process of claim 1 is no different from that of D2 as regards the steps involved in the preparation of the gum base. Although it is not denied that D2 discloses the manufacture of a pre-mix which is then put in an additional mixer where the rest of the usual constituents of base gums are added (page 1, lines 26-30), the process of claim 1 does not exclude such an additional step in an additional mixer. On the contrary, the preparation of a pre-mix in a first mixer and the addition of the remaining ingredients in an additional mixer is corroborated by

- paragraph [0063], which appraises the greater flexibility for feeding different gum base ingredients at different locations,

- dependent claim 27, which requires at least two paddle mixer apparatuses in series,
- figure 10, which illustrates a two-mixer arrangement, and
- examples 2-4 and 6-9, which are performed using a two-mixer arrangement.

2.2.3 Regarding the homogeneity of the gum base of D2, reference is made to the paragraph bridging pages 3 and 4, and to page 5, lines 15-16, which discuss the improved distribution of elastomer, plasticizers and fillers in the finished product, and which disclose that these ingredients are added in such a way as to improve the homogeneity of the finished product. Consequently good homogeneity is also intended and achieved according to the teaching of D2.

2.2.4 It is further remarked that the subject-matter of claim 1 does not comprise any feature which explicitly or implicitly relates to the residence time of the gum base in the mixer, the shear conditions or a particular amount of mixer paddles. The patent specification (see paragraph [0014]) does indeed state that the relatively high ratio of mixing paddles to conveying elements is crucial for low shear and long residence times. However, such a feature is not present in the subject-matter of claim 1, which simply requires that the kneading elements comprise mixer paddles without providing the necessary ratio of mixing paddles.

2.2.5 Hence the only technical difference between the process of claim 1 and that of D2 lies in the use of kneading elements covering at least 30% of one or more shafts

for mixers with an L/D ratio greater than 40/1 and at least 40% of one or more shafts for other mixers, wherein the kneading elements comprise mixer paddles which mix the gum ingredients without facilitating significant forward conveyance of the gum ingredients through the mixer.

3. The technical problem - obviousness

3.1 The respondent saw the problem to be solved in the light of D2 in the provision of an improved process which ensures good mixing and a homogenous gum base. But even if one accepts the respondent's subjective problem as being the objective technical problem to be solved, the claimed subject-matter still lacks an inventive step for the following reasons.

3.2 First of all it is noted that the patent in suit associates an improvement of the continuous mixing process with the prolongation of the residence time of the material in the mixer (paragraph [0012], lines 1-3), which is achieved by a specific ratio of mixing **paddles** (paragraph [0014]).

However, as already pointed out, claim 1 is much broader in scope and does not relate only to a mixer, which fulfils the requirement of the specific ratio of **paddles** as set out in paragraph [0014] of the patent specification. According to the wording of claim 1 this specific ratio applies to the kneading elements, which comprise (but are not limited to) mixer paddles. Thus the technical effect of prolonged mixing does not apply to the mixers without the specific paddle ratio, which means that the technical effect and in consequence the technical problem of improving the continuous mixing of

the chewing gum ingredients is not solved over the whole claimed range.

- 3.3 But even if, in favour of the respondent, this deficiency is not taken into consideration, the board agrees with the appellant that the prolongation of the mixing time is just the result of common sense and nothing more. In other words, if the skilled person would see that the currently used residence times (i.e. those of D2) are too short to produce homogeneous mixtures, it is only logical to try to increase residence times to allow for longer mixing times and for more chance of obtaining homogeneous mixtures.

The skilled person would therefore look for means whereby the prolonged mixing times could be achieved in an extruder. He would therefore have consulted D1, a document disclosing a continuous mixer (extruder) for intimately mixing, kneading, blending and/or reacting a wide variety of materials. D1 provides explicit instructions regarding the arrangement of mixing paddles in an extruder that one would need to use to achieve high residence time. Incidentally, D1 discloses that when all flat or straight paddles are employed (up to 100%) a very high retention time is envisaged (figures 2 and 5; column 5, lines 49-50).

- 3.4 Thus, the board in agreement with the appellant considers that the skilled person starting from the disclosure of D2 and aiming at the provision of an improved process would find in D1 the motivation to use the paddle mixer disclosed therein, which falls within the definition of the paddle mixer of claim 1.

The direct consequence of this is that the subject-matter of claim 1 lacks an inventive step and that the main request is not allowable.

3.5 In view of the above considerations, it does not seem necessary to decide on the admittance of D9, which apparently does not represent the closest prior art. D9, a patent application published in 1985, is representative of the earlier conventional methods disclosed in the patent in suit (paragraphs [0002] to [0008]) for the continuous preparation of chewing gum base using a batch process (page 4, lines 1-11, and page 8, lines 1-11).

4. Auxiliary request

4.1 The subject-matter of claim 1 of the auxiliary request corresponds essentially to claim 2 of the main request and specifies that the mixer paddles cover at least 60 percent of the one or more shafts.

4.2 Claim 1 of the auxiliary request also lacks an inventive step for the reasons given for the main request. The specification in the subject-matter of claim 1 that the mixer paddles cover at least 60 percent of the one or more shafts does not change anything in the reasoning set out above. This is because D1 explicitly discloses that in one very efficient arrangement, as shown in figures 2 and 5 and disclosed in column 5, lines 49-55, all flat or straight paddles were employed when a very high retention time was required. In other words, D1 explicitly teaches the use of up to 100 percent flat or straight mixing paddles to achieve a high retention or residence time for the ingredients being mixed. The levels up to 100 percent obviously fall within the

claimed range of at least 60 percent required by claim 1 of the auxiliary request.

- 4.3 Since claim 1 of the auxiliary request does not involve an inventive step, this request is likewise not patentable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



M. Cañueto Carbajo

W. Sieber

Decision electronically authenticated