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Datasheet for the decision of 12 August 2020

Case Number: T 1718/18 - 3.2.08

Application Number: 11706973.2

Publication Number: 2528536

IPC: A61C19/06, A61K9/00, A61K9/70

Language of the proceedings: EN

Title of invention:
DENTAL STRIP FOR ADMINISTRATION OF ORAL TREATMENT

Patent Proprietor:
Colgate-Palmolive Company

Opponent:
The Procter & Gamble Company

Headword:

Relevant legal provisions:
EPC Art. 100(b), 100(a), 54, 56, 123(2)

Keyword:
Grounds for opposition - insufficiency of disclosure (no)
Novelty - main request and auxiliary request 1 (no)
Inventive step - auxiliary requests 2 and 3 (no) - auxiliary request 4 (yes)
Amendments - added subject-matter (no)

Decisions cited:
G 0003/14

Catchword:

Europäisches Patentamt
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Beschwerdekammern

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Case Number: T 1718/18 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 12 August 2020

Appellant: (Opponent)	The Procter & Gamble Company One Procter & Gamble Plaza Cincinnatti, Ohio 45202 (US)
Representative:	Elkington and Fife LLP Prospect House 8 Pembroke Road Sevenoaks, Kent TN13 1XR (GB)
Respondent: (Patent Proprietor)	Colgate-Palmolive Company 300 Park Avenue New York, NY 10022 (US)
Representative:	Jenkins, Peter David Page White & Farrer Bedford House John Street London WC1N 2BF (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 20 April 2018 concerning maintenance of the European Patent No. 2528536 in amended form.**

Composition of the Board:

Chairman	C. Herberhold
Members:	A. Björklund
	C. Schmidt

Summary of Facts and Submissions

I. The opponent (appellant) filed an appeal against the opposition division's interlocutory decision finding that, on the basis of the main request, the patent in suit (hereinafter "the patent") met the requirements of the EPC.

II. Oral proceedings before the Board were held by video conference - as requested by both parties - on 12 August 2020.

III. At the end of the oral proceedings, the relevant requests were as follows:

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 2 528 536 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed and the patent maintained as upheld by the opposition division (main request) or that the patent be maintained on the basis of one of auxiliary requests 1 to 3 from the first-instance proceedings, or auxiliary request 4 submitted with the reply to the grounds of appeal dated 15 January 2019, in combination with the adapted description filed during the oral proceedings.

IV. Independent claims

Claim 1 of the main request, with the feature designations of the impugned decision, reads:

A1 "A dental strip (10) comprising:

A2 a film backing, and

A3 an adhesive layer on one surface of the film backing,

A4 wherein the film backing is detachable from the adhesive layer,

characterised in that

A5 the adhesive layer comprises a water-swellable polymer and at least one active agent."

V. Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the following wording has been added:

"... , wherein the adhesive layer is capable of expanding and infiltrating spaces between teeth on contact with saliva."

VI. Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the following wording has been added:

"..., wherein the active agent comprises a plaque-reducing agent."

VII. Claim 1 of the third auxiliary request combines the amendments made in the first and second auxiliary requests.

VIII. Claim 1 of the fourth auxiliary request differs from claim 1 of the second auxiliary request in that the following wording has been added:

"..., and wherein the water-swellable polymer further includes an effervescent substance that effervesces on contact with water or saliva."

IX. The following documents are of relevance to the decision:

D4 US 6,343,932 B1

D6 WO 2006/085017 A2

D7 WO 98/55079

D8 WO 2007/076396

D12 US 6,153,222 A

D15 H. Omidian *et al*. "Swelling and Crosslink Density Measurements for Hydrogels", Iranian Journal of Polymer Science and Technology, Vol. 3 No. 2, 1994, pages 115-119

D16 S. Durmaz *et al*. "Swelling and Mechanical Properties of Solution-Crosslinked Poly(isobutylene) Gels", Macromolecular Chemistry and Physics, Vol. 203, 2002, pages 663-72

D17 A. Martínez-Ruvalcaba *et al*. "Swelling characterisation and drug delivery kinetics of polyacrylamide-co-itaconic acid/chitosan hydrogels", eXPRESS Polymer Letters Vol. 3 No. 1, pages 25 to 32, 2009

D18 J. Metz *et al*., Abstract of "Effect of crosslinking density of swelling and mechanical properties of PEGDA400/PCLTMA900 hydrogels", 43rd Annual Rocky Mountain Bioengineering Symposium and 43rd International ISA Biomedical Sciences Instrumentation Symposium Vol. 464, 2006

D20 Lubrizol Technical Data Sheet, 16 September 2009

D21 P. J. Flory, "Principles of polymer chemistry", Ithaca; Cornell University Press, 1953, pages 584 to 588

D22 Dr T. Englin, Experimental Report of "Carbopol 981 NF Gel Formation and Water Uptake Experiment" dated 9 November 2017

X. The appellant argued essentially the following:

Sufficiency of disclosure

The patent did not set out any test for the skilled person to determine whether a given polymer was water-swellable or not. This was exemplified when trying to distinguish between a water-swellable or a water-swollen polymer, which described the same material. The patent did not define any parameters by which the skilled person could tell if a polymer was swellable, partially swollen or fully swollen. There was no agreement on a standard test either.

Furthermore, the patent did not state the properties of the film backing and the adhesive layer which rendered the film backing layer detachable. Additionally, according to paragraph [0033] of the patent in suit, in one embodiment the film backing remained attached to the adhesive layer.

The invention was thus not sufficiently disclosed for it to be carried out by the skilled person.

Main request - novelty

The subject-matter of claim 1 was not novel over the dental strip disclosed in D4.

Feature A5 did not require the adhesive layer to be homogeneous or to have the same properties across its thickness. The core 12 and the gel 16, which contained an active agent, together formed a layer having substantially the same thickness over the entire width of the dental strip, both where the gel was present and where it was not. The gel and the core were both described as being somewhat tacky. They thus formed an adhesive layer within the meaning of claim 1 of the patent in suit, in particular since paragraph [0024] of the patent described that the adhesive layer could be coated with the active agent; the claim thus covered an essentially two-layer construction of the adhesive layer.

Both the core and the gel comprised Carbopol, which was listed in the patent as an example of a water-swellable polymer. This term could not be read as being limiting since the patent did not contain any qualification or test for what qualified as a water-swellable polymer. D15 to D18 showed that there was no standard definition of water-swellability.

The experiment described in D22 showed that, even in a diluted state, the gel used in D4 had the capacity to take up water and swell further. As shown in D20, it was known to the skilled person that an over-neutralisation led to a rapid drop in viscosity, which they would make sure to avoid. The peroxide used as the whitening agent in the gel did not neutralise the polymer and thus did not influence its water-swellability. Finally, since the gel had high viscosity and was tacky, it could not be fully saturated with water. It was therefore implicit that the gel in D4 could take up water and expand during use.

Furthermore, the core - which was freeze-dried - contained Carbopol, which would take up water and swell during use.

The adhesive layer formed by the combination of the core and the gel thus formed an adhesive layer according to feature A5.

In conclusion, the subject-matter of claim 1 of the main request was not novel.

First auxiliary request - novelty

Since the adhesive layer of the dental strip in D4 absorbed water during use, it would inevitably expand and infiltrate the spaces between the teeth upon contact with saliva.

The subject-matter of claim 1 of the first auxiliary request was thus not novel either.

Second and third auxiliary requests - inventive step

The subject-matter of claim 1 of the second and third auxiliary requests differed from the dental strip in D4 in that the active agent comprised a plaque-reducing agent.

This difference solved the problem of providing an alternative dental strip or the problem of providing a strip which reduces plaque.

D4 itself suggested that other active agents could be substituted for the whitening agent.

Plaque-reducing agents were among the most common active agents for dental strips, as shown in e.g. D7, page 13.

It would thus be obvious for the skilled person to substitute the whitening agent of the dental strip in D4 for a plaque-reducing agent in order to solve the problem posed.

Consequently, the subject-matter of claim 1 of the second and third auxiliary requests did not involve an inventive step.

Fourth auxiliary request - added subject-matter, inventive step and adaptation of the description.

Claim 1 of the fourth auxiliary request combined features of two unrelated and distinct embodiments found in paragraphs [0025] and [0028] of the original application, thus leading to an extension of the subject-matter of claim 1 beyond the content of the application as originally filed.

The subject-matter of claim 1 did not involve an inventive step either.

The subject-matter of claim 1 of the fourth auxiliary request differed from the dental strip in D4 in that the active agent was a plaque-reducing agent and possibly in that the polymer further included an effervescent substance.

The patent did not provide any evidence of an improved, more effective or deeper delivery due to this combination. These differences therefore had no synergistic effect and only solved partial problems.

The substitution of a plaque-reducing agent for the whitening agent was obvious to the skilled person for the reasons set out with respect to the second and third auxiliary requests.

The inclusion of an effervescent substance solved the problem of providing an alternative dental strip. The use of such substances in oral products comprising water-swellable polymers was known from D12, column 2, lines 13 to 20, which described the effect of the effervescent substance in the same wording as the patent. It would therefore have been obvious for the skilled person to include effervescent substances in the polymer in D4 in order to solve the problem posed.

The skilled person would thus arrive at the claimed dental strip without any inventive skill.

Alternatively, the skilled person would replace some, but not all, of the peroxide of the dental strip D4 with a plaque-reducing agent, or they would simply add the plaque-reducing agent. While D4 did not disclose a combination of active agents, it did not discourage it either. It was generally known that mixtures of active agents could be used, as evidenced by e.g. D7. The respondent did not demonstrate prejudice against combining hydrogen peroxide with plaque-reducing agents. For the reasons already given, it would be obvious for the skilled person to use a plaque-reducing agent in the dental strip in D4. The remaining peroxide was an effervescent substance, and so the skilled person would also arrive at the claimed subject-matter without any inventive skill.

The description was not adapted to the claims. Paragraph [0023] should explicitly exclude the

possibility of the effervescent substance being hydrogen peroxide since this had been argued by the respondent in the inventive-step discussion; without that exclusion the subject-matter was not inventive. Furthermore, all paragraphs mentioning the active agent should be amended to state that the active agent was a plaque-reducing agent.

XI. The respondent argued essentially the following:

Sufficiency of disclosure

Water-swelling polymers were well known (see e.g. D21) and could be clearly identified by the skilled person. The patent described the properties and behaviour of swellable materials in paragraph [0021]. The skilled person could therefore identify whether or not a polymer was water-swellable without undue burden. Additionally, paragraph [0022] provided a list of suitable materials.

Furthermore, the skilled person could easily verify whether a film backing was detachable or not simply by handling the dental strip. Suitable film backings were mentioned in paragraphs [0012] to [0015]. The editorial inconsistency between the claims and paragraph [0033] was, if anything, an issue of Article 84 EPC and not a ground for opposition.

The invention was therefore sufficiently disclosed for it to be carried out by the skilled person.

Main request - novelty

The coating used in the manufacturing method described in paragraph [0024] of the patent in suit did not form

a separate element since it was absorbed by the adhesive, in contrast with the solution used for forming the film backing as described in paragraph [0016] of the patent. The strip disclosed in D4 had a core and a gel which were two separate physical elements. The gel could even be supplied separately in a tube and be applied to the core by the user. The core and the gel of D4 thus could not be one adhesive layer within the meaning of the claim.

Furthermore, the gel of the dental strip in D4 was not water-swellable in the correct interpretation of the term, which should take the whole disclosure of the patent in suit into account. Paragraph [0001] of the specification described the disadvantage of the prior-art substrates as being that the treatment was generally limited to the tooth surface and did not infiltrate between the teeth. Paragraphs [0004], [0005] and [0034] described that the adhesive layer of the dental strip of the patent in suit did expand and infiltrate between the teeth. On the other hand, paragraph [0031], which concerned a non-claimed oral treatment method, was not relevant for construing the term water-swellable. The water-swellability depended on conditions such as solvent and pH. These were known and discussed in e.g. D21. Therefore, the term water-swellable should be understood as meaning adhesive layers which were capable of taking up water and of swelling to infiltrate between the teeth under the use conditions of the dental strip.

It was, however, not disclosed that the gel of the dental strip in D4 could absorb water and expand to infiltrate between the teeth during use – it was in fact flowable. The gel was neutralised with sodium hydroxide and further contained a whitening agent. As

described in D15 to D17, the neutralisation reduced the viscosity and thus the swelling. The experiment described in D22 was not carried out with the same polymer. Moreover, it was carried out in water and the viscosity was only estimated, not tested. The polymer in the experiment did not comprise the whitening agent (hydrogen peroxide) either. The experiment did therefore not demonstrate that the gel in D4 was water-swellable under the conditions of use. The gel, which, additionally, was not on the surface of the backing layer as claimed, was therefore not an adhesive layer according to feature A5.

The core did not contain an active agent, was not shown to be swellable and was therefore not an adhesive layer within the meaning of feature A5 either.

The subject-matter of claim 1 of the main request was therefore novel.

First auxiliary request - novelty

The amendment made to the first auxiliary request explicitly defined how the term water-swellable was to be understood.

As set out with respect to the main request, neither the gel nor the core of the dental strip in D4 was water-swellable within the correct, now explicitly defined understanding of the term.

The subject-matter of claim 1 of the main request was therefore novel.

Second and third auxiliary requests - inventive step

The subject-matter of claim 1 of these requests differed from the dental strip in D4 at least in that the active agent was a plaque-reducing agent.

The problem formulated by the appellant, i.e. to provide a dental strip that reduced plaque, was incorrect since it contained a pointer to the solution.

Instead, the problem to be solved was to provide a dental strip which treated interdental spaces more effectively.

D4 concerned a cosmetic treatment – whitening – where treatment of interdental spaces was not important. The system disclosed in document D7 had another purpose, namely to protect the oral care substance from erosion and interaction with saliva for a time sufficient for the active [agent] to provide a therapeutic benefit. The skilled person thus had no incentive to choose a plaque-reducing agent from the long list of possible active agents disclosed in D7 for use in the strip according to D4.

Consequently, the subject-matter of claim 1 of the second and third auxiliary requests involved an inventive step.

Fourth auxiliary request - added subject-matter, inventive step and adaptation of the description

The combination of a plaque-reducing agent and a polymer further including an effervescent substance did not extend beyond the content of the original application.

Paragraph [0010] described that features of different embodiments were not mutually exclusive and could be combined. Paragraphs [0025] and [0028] used open language which also encompassed the combination of an effervescent substance and an active agent in the form of a plaque-reducing agent, especially since original claim 2 already specified that a plaque-reducing agent was a preferred active agent.

Furthermore, the subject-matter of claim 1 differed from the dental strip in D4 on account of both the plaque-reducing agent and the effervescent substance. These differences had a synergistic effect since the effervescence forced the plaque-reducing agent into the areas between the teeth which were hardest to brush – exactly where it was most needed. This relied on a physical effect which was plausible from the patent without the need for any further evidence.

The problem to be solved was thus to provide a dental strip with an improved capacity to deliver the plaque-reducing agent to interdental spaces.

D4 did not mention interdental delivery. It explicitly mentioned substituting – not combining – the whitening agent peroxide in the specific gel with another active agent, thus teaching away from a combination of active agents. D12 did not mention anything about delivery of plaque-reducing agents to the interdental spaces either, and concerned a dentifrice rather than a dental strip. It also taught away from using film backings. D7 was a patent document and as such not evidence of the common general knowledge. Furthermore, none of the cited prior art discussed the compatibility of various active agents. D2 and D8, which were mentioned in this

context, had never been used in the appeal proceedings before the oral proceedings and should be disregarded for that reason alone.

The description filed during the oral proceedings did not contradict the claims, but rather supported them. The question of whether peroxide as such could act as an effervescent substance was not relevant to the outcome of the discussion on inventive step; the decisive factors were whether it was acting as an effervescent substance in the particular dental strip in D4 and whether it would have been obvious to combine the peroxide in D4 with a plaque-reducing agent. The amendments to paragraph [0023] suggested by the appellant were thus not necessary.

Reasons for the Decision

1. Sufficiency of disclosure

1.1 The objection raised concerning the alleged contradiction between claim 1, in which the backing layer is defined as being detachable, and paragraph [0033], which suggests a non-detachable backing layer, concerns a lack of support for the claims in the description under Article 84 EPC, rather than an objection under Article 83 EPC. This discrepancy was already present in the patent as granted and is not a result of the amendments made during the opposition proceedings (deletion of dependent claims 17 and 18). As explained in the catchword of decision G 3/14 of the Enlarged Board of Appeal, the claims of the patent may be examined for compliance with the requirements of Article 84 EPC only when, and then only to the extent that the amendment introduces non-compliance with

Article 84 EPC. This objection will therefore not be examined.

1.2 The appellant further alleged that the skilled person would not be able to find suitable backing layer and adhesive layer combinations which would allow the film backing to be detached. However, they have not provided any convincing reasons for this assertion.

Film backings detachable from adhesives are known in many arts and paragraphs [0012] to [0015] of the patent in suit describe several possible film backings. The skilled person would therefore not have any problems finding suitable combinations of film backings and adhesive layers.

1.3 It is true that the patent does not describe any test for water-swellability. However, water-swellability of polymers has long been known; see e.g. D21, which was published in 1953. Furthermore, the patent in suit lists several suitable water-swellable polymers in paragraphs [0021] to [0022].

1.4 The patent therefore discloses the invention in a manner sufficiently clear and complete for it to be carried out by the person skilled in the art. It follows that the objection under Article 100(b) EPC does not prejudice the maintenance of the patent.

2. Main request - novelty

2.1 It is common ground that D4, Figure 1 discloses a dental strip having features A1 to A4.

2.2 With respect to feature A5, the respondent argued that the combination of the core 12 and the gel 16 of the

dental strip disclosed in D4 could not be an adhesive layer since they were separate elements.

However, feature A5 does not explicitly require the adhesive layer to be homogeneous: paragraph [0024] of the patent in suit explicitly describes that "in [other] embodiments, the adhesive layer ... is coated with one or more active agents". The respondent's argument that this paragraph, like paragraph [0016] of the patent, only described a manufacturing method and that the active agent would be absorbed and distributed evenly within the adhesive layer is not convincing since paragraph [0024] does not state that the coating is a manufacturing step or that the coating is absorbed by the adhesive layer to form a homogeneous layer. In the absence of any such disclosure, the term coating must be understood in the usual sense, i.e. as a thin layer of active agent on, or in, the top of the adhesive layer. Consequently, the term "layer" in feature A5 cannot be read as requiring a layer which is homogeneous across its width and thickness, but rather it must be construed to include embodiments which are of an essentially two-layer inhomogeneous construction.

As can be seen in Figure 1 of D4, the dental strip has the same thickness over its entire width, both where the core 12 extends to the top of the strip and also where it has a channel 14 filled with the gel 16 comprising the whitening agent. As further described in column 4, lines 46 to 47 the gel is preferably arranged in the channel prior to packaging. Both the core (see column 4, lines 20 to 21) and the gel (see lines 35 to 39) are somewhat tacky. The combination of the core and the gel of the dental strip in D4 is therefore regarded as an adhesive layer within the meaning of feature A5 as used in the patent.

2.3 As described in lines 9 to 15 and 39 to 44 of column 4 of D4, both the core and the gel comprise a Carbopol (a group of polymers), which, as set out in paragraph [0022] of the patent in suit, is a water-swellable polymer suitable for the claimed dental strip. Furthermore, the gel contains an active agent in the form of hydrogen peroxide.

The dental strip in D4 therefore discloses feature A5.

2.4 The respondent argued that in view of the entire disclosure of the patent in suit, the term water-swellable should be understood to mean "being able to expand and infiltrate the spaces between teeth during use conditions". In its opinion, the gel 16 of the dental strip in D4 was flowable and not able to take up water to expand and infiltrate the spaces between the teeth. Since the extent to which the gel had been neutralised was not known, and since the gel also contained peroxide as a whitening agent, the ability to take up water and swell to infiltrate between the teeth during use was not implicitly disclosed to the skilled person.

The experiment described in D22 shows that a gel of Carbopol which has been considerably (90%) neutralised by sodium hydroxide is also able to absorb additional water and expand further. It is true that the polymer used in the experiment was not exactly the same as the one used in D4 (Carbopol 981 NF instead of 981 P NF), that the solvent used was water instead of saliva and that the viscosity was estimated, not measured. Nevertheless, the experiment convincingly shows that a gel of Carbopol does take up additional water. Furthermore, as evidenced by D20, Figure 1, it is known

to the skilled person that an "over-neutralised" Carbopol quickly loses its viscosity, which is undesirable. The skilled person would therefore not construe the gel 16 of D4 as being over-neutralised or completely saturated with water, especially since the pre-arranged gel 16 in D4 is described as having a rather high viscosity and being somewhat tacky so as to adhere to both the core and a person's teeth; see column 4, lines 36 to 44.

While the respondent has tried to cast doubt on the experimental result in D22, they have not put forward any evidence, e.g. a counter-experiment, which convincingly showed that the choice of the marginally different polymer, the solvent (water instead of saliva) or the estimated viscosity and the lack of hydrogen peroxide in the D22 experiment invalidated its result. In view of the evidence provided by the appellant, the Board is thus convinced that the capability to absorb further water from saliva with subsequent swelling during use is an inherent property of the gel in D4.

The core of the dental strip in D4 comprises the same polymer, Carbopol, as the gel. The core is freeze-dried and somewhat tacky; see column 4, lines 9 to 11 and 20 to 21. Therefore, the core is also able to take up water during use.

As accepted by the respondent at the oral proceedings, a water-swellable polymer which absorbs water and expands during use would - if provided on a dental strip as claimed - inevitably infiltrate the spaces between the teeth. As explained above, the combination of the core and the gel of the dental strip in D4 will take up water during use. The dental strip in D4

therefore discloses feature A5 even under the respondent's narrower understanding of the term water-swellable.

2.5 Consequently, the subject-matter of claim 1 is not novel over the dental strip disclosed in D4.

3. First auxiliary request - novelty

As set out in point 2 above with respect to the main request, the adhesive layer formed by the combination of the core and gel of the dental strip in D4 is an adhesive layer comprising a water-swellable polymer capable of expanding and infiltrating the spaces between the teeth on contact with saliva when in use.

Consequently, the subject-matter of claim 1 of the first auxiliary request is not novel over the dental strip disclosed in D4 either.

4. Second and third auxiliary requests - inventive step

It is undisputed that the subject-matter of claim 1 differs from the dental strip in D4 in that the active agent comprises a plaque-reducing agent.

As set out with respect to the main and first auxiliary requests, the adhesive layer of the dental strip in D4 would expand and infiltrate the spaces between the teeth. It would therefore also deliver its active agent to the spaces between the teeth, thus already achieving improved delivery of the active agent to the interdental spaces.

It follows that the problem formulated by the respondent, namely to provide a dental strip with

improved delivery of the active agent, is already solved. Furthermore, one of the problems defined by the appellant – to provide a dental strip which reduces plaque – contains an explicit pointer to the solution and is therefore based on hindsight.

Paragraphs [0025] and [0026] of the patent in suit contain a list of various active agents but do not set out any particular problem solved by the choice of a specific active agent.

Therefore, the further problem formulated by the appellant, i.e. to provide an alternative dental strip, which - since the claimed subject-matter differs from the disclosure of D4 only in the active agent - has to be understood as being a dental strip having an alternative action, is to be used for the assessment of inventive step.

Plaque-reducing agents are among the most common active agents used in oral care products. As evidenced by D7, page 13, the skilled person knows that they can be used in dental strips.

When substituting another active agent for the whitening agent of the dental strip in D4, as suggested in column 6, lines 5 to 13, selecting a plaque-reducing agent as the active agent would be an obvious alternative. The skilled person would thus arrive at the subject-matter of claim 1 of the second and third auxiliary requests without any inventive skill.

Consequently, the subject-matter of claim 1 of each of the second and third auxiliary requests does not involve an inventive step.

5. Fourth auxiliary request

5.1 Added subject-matter

The appellant argued that paragraphs [0025] and [0028] of the application as originally filed disclosed distinct embodiments where the active agent was a plaque-reducing agent and where the polymer further included an effervescent substance, respectively, but that these features were never disclosed in combination. The combination of these two embodiments in claim 1 of auxiliary request 4 thus led to an extension of subject-matter.

However, paragraph [0010] of the original application indicates that the features of separate embodiments may be combined. Furthermore, the language of paragraph [0025] is open and does not exclude the possibility of combining the effervescent substance with any of the active agents listed in paragraph [0028]. Finally, in the particularly relevant embodiment of original dependent claim 2, the active agent comprises a plaque-reducing agent. The skilled person would therefore take the combination of this active agent and a polymer further comprising an effervescent substance to be disclosed in the application as originally filed.

Claim 1 of the fourth auxiliary request therefore fulfils the requirements of Article 123(2) EPC.

5.2 Inventive step

It is undisputed that the subject-matter of claim 1 differs from the dental strip in D4 in that the active agent is a plaque-reducing agent.

5.2.1 If the peroxide was replaced entirely with another active agent, such as a plaque-reducing agent, as submitted in a first line of reasoning by the appellant, the subject-matter of the claim would also differ in that the polymer further includes an effervescent substance.

Contrary to the appellant's argument, the effervescent substance leads to increased and thus improved delivery of the active agent between the teeth. While this is not described explicitly in the patent, it is a physical effect of the effervescence that is immediately apparent to the person skilled in the art.

In the case of a plaque-reducing agent, this does have a synergistic effect. The interdental space is the part of the teeth where the delivery of such an agent is most beneficial due to the difficulties of mechanical plaque removal. The effervescent substance helps to carry the active agent to surfaces which - even after the water-swellable polymer has swollen - may not be fully in contact with the adhesive layer.

The technical problem to be solved is thus to provide a dental strip with an alternative action and improved capacity for delivery of its active agent to the interdental spaces.

D12 does not mention plaque-reducing agents and is instead concerned with improving the handling of a sheet-like carrier for administration of active substances in general. The skilled person would therefore not consider this document to solve the problem posed. Even if they did, they would not find any teaching concerning the delivery of active agents

to the interdental spaces which would incite them to include an effervescent substance in the polymer in D4.

5.2.2 In a second line of reasoning, the appellant argued that it would be obvious to the skilled person to replace some, but not all, of the whitening agent (hydrogen peroxide) in the gel of the dental strip in D4 with a plaque-reducing agent, or to simply add the plaque-reducing agent to the strip in D4. The peroxide still present in the strip would be an effervescent substance, in which case the resulting product would fall under the definition of the allegedly inventive claim.

However, while combinations of different active agents in general may be known, not all active agents are compatible.

Furthermore, D4, column 4, lines 5 to 13 explicitly discloses that another material is substituted for the whitening agent, i.e. it is explicitly taught to replace the hydrogen peroxide with another agent. D4 thus teaches away from combining the whitening agent peroxide with other active agents.

This argument also applies when considering documents D2, D7 and D8, so it is irrelevant whether or not the arguments based on those documents are to be admitted into the appeal proceedings.

The invention defined in claim 1 of the fourth auxiliary request thus involves an inventive step.

5.3 Conformity of claims and description

Paragraph [0003] defines the invention and unambiguously states that the active agent comprises a plaque-reducing agent. Since this is not contradicted by using the broader term "active agent" in following passages of the description, it is not necessary to amend all passages which use the term "active agent".

While paragraph [0023] does indeed not exclude hydrogen peroxide from effervescent substances, there is also no need to do so since the paragraph does not contradict the claims according to the fourth auxiliary request (which were found allowable; see above).

The claims of the fourth auxiliary request are thus supported by the description as required by Article 84 EPC.

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 form:
- Claims 1 to 15 of auxiliary request 4, filed with the reply to the statement of grounds of appeal dated 15 January 2019,
- Description: paragraphs [0001] to [0034], submitted via email during the oral proceedings before the Board,
- Drawings: Figures 1 to 3 of the patent specification.

The Registrar: The Chairman:

D. Magliano C. Herberhold

Decision electronically authenticated