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Datasheet for the decision of 19 June 2018

Case Number: T 1067/17 - 3.3.07

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Title of invention:
Methods of providing two-part self-adhering dental compositions

Patent Proprietor:
Kerr Corporation

Opponent:
3M Deutschland GmbH

Headword:
Dental composition/ KERR

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - main request (no) - auxiliary request (no)

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Case Number: T 1067/17 - 3.3.07

D E C I S I O N
of Technical Board of Appeal 3.3.07
of 19 June 2018

Appellant: (Patent Proprietor)	Kerr Corporation 1717 West Collins Avenue Orange, CA 92867 (US)
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Appellant: (Opponent)	3M Deutschland GmbH Carl-Schurz-Strasse 1 41453 Neuss (DE)
Representative:	Brem, Roland 3M ESPE AG IP Department ESPE Platz 82229 Seefeld (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 8 March 2017 concerning maintenance of the European Patent No. 1502569 in amended form.**

Composition of the Board:

Chairman	J. Riolo
Members:	A. Usuelli
	P. Schmitz

Summary of Facts and Submissions

I. European Patent 1 502 569 was opposed on the grounds that its subject-matter lacked novelty and inventive step, was not sufficiently disclosed and extended beyond the content of the application as filed.

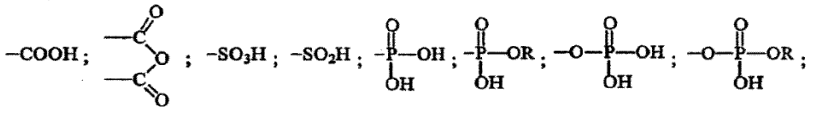
The following documents were among those cited during the first-instance proceedings:

D2: US 6,214,101
D5: EP 1 269 968
D6: WO 02/085313
D7: EP 319 639

II. The appeals of the patent proprietor (hereinafter: appellant-patent proprietor) and of the opponent (hereinafter: appellant-opponent) lie against the decision of the opposition division according to which the subject-matter of auxiliary request 3 met the requirements of the Convention. The decision was based on a main request and on two auxiliary requests (named auxiliary requests 1 and 3) all filed with letter of 27 November 2015.

Claim 1 of the main request read as follows:

"1.A method for providing a dental composition comprising providing a paste/paste two-part self-adhering dental composition comprising
(a) at least one acidic compound containing at least one acidic moiety selected from the group consisting of



where R is an alkyl or aryl group;

(b) at least one polymerizable monomer without any acidic group where the polymerizable group is selected from the group consisting of an acrylate, a methacrylate and a vinyl group;
(c) at least one finely divided filler;
(d) at least one reducing agent: and
(e) at least one oxidizing agent:
wherein (d) at least one reducing agent and (e) at least one oxidizing agent form a self-cure initiator system in which when the two pastes are mixed, (d) at least one reducing agent and (e) at least one oxidizing agent come into contact with each other and a redox reaction takes place which generates free radicals and initiates polymerisation of monomers, leading to curing or hardening of the composition, wherein the ratio of the first paste containing (a) to a second paste not containing (a) or containing a lower concentration of (a) ranges from 1.05:1 (by volume) to 20:1 (by volume), with the proviso that the composition does not comprise a substituted thiourea.

Claim 1 of auxiliary request 1 differed from claim 1 of the main request in that the ratio of the first paste to the second paste was in the range from 1.5:1 to 20:1 instead of 1.05:1 to 20:1 (always by volume).

Claim 1 of auxiliary request 3 differed from claim 1 of the main request in that the ratio of the first paste to the second paste was in the range from 2:1 to 20:1 instead of 1.05:1 to 20:1 (always by volume). Moreover, the following feature was added to the claim:

"...wherein the first paste containing (a) is in a first syringe barrel and the second paste not containing (a) or containing a lower concentration of (a) is in a second syringe barrel, the first and second

syringes selected from group consisting of two non-joining individual syringes and one dual-syringe assembly, wherein the ratio of an internal cross-sectional area of the first syringe barrel containing the first paste to the second syringe barrel containing the second paste is in the range of 2:1 (by volume) to 20:1 (by volume)..."

III. In the decision under appeal the following conclusions were reached by the opposition division:

(a) The main request was not novel over the self-adhering two-part composition disclosed in example 6 of D5.

(b) Claim 1 of auxiliary request 1 was novel over D5 on account of the feature concerning the volume ratio between the two pastes.

(c) Document D5 and D6 were both suitable starting points for the assessment of inventive step. The subject-matter of claim 1 of auxiliary request 1 differed over the disclosures of D5 and D6 on account of the mixing ratio of the two pastes (1.5:1 (by volume) to 20:1 (by volume)). In the absence of any technical effect or unexpected advantage the variation of the mixing ratio was an arbitrary modification which could not be considered to involve an inventive activity. The requirement of Article 56 EPC was therefore not met.

(d) Claim 1 of auxiliary request 3 differed over the disclosures of D5 and D6 in the mixing ratio of the two pastes (2:1 (by volume) to 20:1 (by volume)) and in the requirement that the two pastes were

packaged in two syringe barrels wherein the ratio of an internal cross-sectional area of the first syringe barrel to the second syringe barrel was in the range 2:1 (by volume) to 20:1 (by volume). D7 disclosed double barrel syringes having compartments of unequal diameter. However, they were used for dental impression materials which were chemically different from the self-adhering materials disclosed in D5 and D6. Thus, the skilled person would have not combined D7 with D5 and/or D6. The subject-matter of auxiliary request 3 was therefore inventive.

IV. With the statement setting out the grounds of appeal sent on 7 July 2017 the appellant-patent proprietor re-submitted the same requests considered in the decision under appeal (the two auxiliary requests were still designated as auxiliary requests 1 and 3).

V. In its statement setting out the grounds of appeal submitted on 6 July 2017 the appellant-opponent requested that the decision under appeal be set aside and the patent be revoked. On the same date it filed the following document:

D9: WO 97/11670

VI. On 24 April 2018 the Board issued a communication pursuant to Article 15(1) RPBA. In relation to the requirement of inventive step it considered that document D5 was the closest prior art. Concerning auxiliary request 3 the Board observed that devices for dispensing dental materials, characterised by the presence of two compartments of different cross-sectional areas, were known form D7 and D9.

VII. The arguments of the appellant-opponent in relation to the requirement of inventive step, can be summarised as follows:

Document D5 was the closest prior art. The distinguishing feature of the method according to the main request and auxiliary request 1, if any, was the mixing ratio of the two pastes. The person skilled in the art knew that increasing the concentration of the acidic component in the first paste was detrimental to the stability of the paste. Thus, if he wanted to increase the bond strength of the mixed paste by increasing the amount of acidic component he could only increase the volume of the first paste. Document D2 suggested the possibility of varying the mixing ratio of the two components. Hence, the subject-matter of the main request and of auxiliary request 1 did not comply with the requirements of Article 56 EPC.

Dual syringes with barrels of different sections were disclosed in D7 and D9. In view of the teaching of these documents, the subject-matter of auxiliary request 3 was not inventive either.

VIII. The arguments of the appellant-patent proprietor in relation to the requirement of inventive step, can be summarised as follows:

According to the method for providing a dental composition defined in claim 1 of all the requests, the paste containing a greater concentration of acidic compound was used in excess (by volume) compared to the other paste. In document D5, representing the closest prior art, the two pastes were combined in a ratio 1:1. This difference had the effect of improving the bond strength of the mixed composition without impairing the

stability of the two pastes. Permitting a higher concentration of the acidic compound in the mixed composition without increasing its concentration in the first paste was an unique concept. This was achieved by a simple solution, namely by using a higher amount (by volume) of the paste containing a greater concentration of acidic compound. The technical problem was the provision of a method that allowed to increase the bond strength of the mixed composition without causing problems of degradation. Document D5 did not suggest increasing the volume of one of the two pastes compared to the other. Document D2 was not relevant since it did not concern compositions in which the polymerization was initiated by a redox reaction. Furthermore, in the most part of the examples the acid-containing past was used in excess over the other paste. D6 suggested a different solution to the problem of preserving the stability of the pastes, namely to put some of the components in a dispersed phase. On the basis of the teaching of the prior art documents, the skilled person had no reason to increase the volume of the first paste.

The method defined in claim 1 of auxiliary request 3 differed from the disclosure of D5 also in the use of a specific syringe for mixing and delivering the two pastes. The features of the syringe were inextricably linked with the mixing-ratio of the two pastes. D5 did not describe any syringe. Documents D7 and D9 were not relevant since they did not concern self-adhering cement compositions. Moreover, it would have not been straightforward to adapt the syringes disclosed in these documents in order to render them useful for mixing and delivering self-adhering compositions.

IX. The appellant-patent proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request or one of auxiliary requests 1 or 3, all filed with the statement setting out the grounds of appeal on 7 July 2017.

X. The appellant-opponent requested that the decision under appeal be set aside and that the patent be revoked.

Reasons for the Decision

Main request

1. Inventive step

1.1 The invention relates to a method of providing a two-part paste/paste self-adhering composition which results in an improved adhesion of the composition to various dental substrates (see [0001]). One of the features of the method is that the first paste contains an acidic compound in higher concentration compared to the second paste or it contains the whole amount of it, and the ratio (by volume) of the first paste to the second paste is greater than 1:1 (see [0016] and claim 1). In other words, the paste containing a higher concentration of acidic component (or containing the whole amount of it) is used in excess (by volume) compared to the other paste.

1.2 Closest prior art

1.2.1 Document D5 relates to a dental cement composition which, after it has been cured, bonds to hard tissues

such as tooth enamel and dentin (see paragraph [0001]). The Board agrees with the opposition division and with the parties that this document is a suitable starting point for the assessment of inventive step.

1.2.2 Example 6 of D5 concerns a two-part composition consisting of two pastes named A and B which are mixed before use. Paste A contains an acidic component, namely polyacrylic acid, which is not present in paste B. It was not disputed by the parties that the cement composition obtained after mixing the two pastes contains all the components (a) to (e) recited in claim 1 of the main request.

1.2.3 There is no explicit information in example 6, or in any other part of D5, as to the volumes in which the two pastes A and B are combined. The appellant-patent proprietor expresses the view that in the absence of any clear indication in this regard it must be assumed that the two pastes are combined in a ratio 1:1 by volume.

In the following assessment of inventive step, the Board accepts the appellant-patent proprietor's position. Accordingly, the method for providing a dental composition of claim 1 differs from the disclosure of example 6 of D5 in the mixing ratio of the two pastes.

1.3 Technical problem

1.3.1 As explained by the appellant-patent proprietor, the effect of using a higher volume of first paste (i.e. of the paste containing an higher concentration of acidic component or the whole amount of it) relative to the second paste is that the acid concentration in the

mixed paste can be raised without having to increase the concentration of acid in the first paste. A higher concentration of acid in the mixed paste improves the self-adhesive properties of the paste and the resulting bond strength increases. Furthermore, since the acid concentration in the first paste is not increased, the method of claim 1 makes it possible to minimize problems of degradation of the components of the first paste.

1.3.2 In the appellant's favour, the Board accepts that the method of claim 1 results in an increase of the bond strength of the cement composition without impairing the stability of the first paste. The technical problem can therefore be defined as the provision of a method for providing a self-adhering cement composition that allows improved bond strength without risking an increase in degradation of the paste components.

1.4 Obviousness

1.4.1 Before the priority date of the patent-in-suit, the skilled person knew that the acidic component ensures the bond strength of the dental cement composition. For instance, D5 states that the monomer with the acid group "is indispensable for ensuring the bonding power of the cement composition to the teeth" (see [0011]). This point has never been disputed by the appellant-patent proprietor and in some submissions it has also been acknowledged (see letter of 19 April 2018, page 4, third paragraph).

1.4.2 The skilled person knew also that a high concentration of acid in one of the two pastes can have a detrimental effect on the stability of that paste. For instance, document D6 explains that the peroxide oxidizing agents

can react with compounds having acid functionality (page 3, lines 23 to 27). This issue is also discussed in paragraph [0006] of the patent-in-suit where it is presented as a problem known in the art. Also the appellant-patent proprietor, on page 5 of its statement setting out the grounds of appeal acknowledges that at the priority date it was well known to the skilled person that excessive acidity in the first paste may cause problems of degradation.

1.4.3 To summarize, at the priority date of the patent-in-suit the skilled person was aware that a high concentration of acidic component in the mixed paste increases the bond strength of the dental cement composition. However, he also knew that a too high concentration of acidic component in one of the preparatory pastes could result in problems of stability of that paste.

1.4.4 In view of this general knowledge, the skilled person faced with the problem of providing a method for preparing a self-adhering composition that results in an improved bond strength without causing problems of degradation, would obviously look for solutions that allow to increase the concentration of the acidic component in the mixed paste, without increasing at the same time the concentration of this component in the paste containing it.

1.4.5 The concentration of the acidic component in the mixed paste is the ratio between the amount of this component and the volume of the mixed paste. Thus, it can be increased by increasing the amount of the acidic component or by decreasing the volume of the mixed paste. The first option implies an increase of the acidic component also in the paste that contains this

component. This option would therefore be avoided by the skilled person in order to reduce the risks of paste-degradation. Accordingly, he would consider the other option, namely reducing the total volume of the mixed paste. This can be done by reducing the amount of the volume of the preparatory paste that does not contain the acidic component whereas a reduction of the paste containing the acidic component would not be effective since it will also reduce the amount of this component in the mixed composition.

1.4.6 Hence, the skilled person trying to improve the adhesive properties of the cement composition disclosed in example 6 of D5 would realise that this can be done by reducing the volume of paste B compared to paste A. This would have the effect of increasing the concentration of polyacrylic acid in the mixed composition without increasing its concentration in paste A.

In this way he would arrive at the claimed subject-matter without exercising any inventive skill.

1.4.7 The appellant-patent proprietor argued that neither D5 nor any other available prior art document suggested to prepare a cement composition by mixing the two preparatory pastes in different volumes.

In this respect it is noted that D2 describes the preparation of a dental cement composition by mixing two pastes in a ratio 5:1 to 1:10 by weight (column 5, lines 42 to 56). The difference by weight is so pronounced that it implies, very likely, a difference also by volume. The appellant-patent proprietor correctly pointed out that D2 concerns a dental glass ionomer cement, i.e. a different type of dental cement

composition. Notwithstanding this, in the Board's view D2 indicates that in two-part dental compositions the two pastes are not always combined in a 1:1 ratio, as argued by the appellant-patent proprietor.

In any case, even disregarding the teaching of D2, it was part of the knowledge of the skilled person that the bond strength of the dental cement composition is linked to the concentration of the acidic component in the mixed paste (see point 1.4.1 above). That this concentration can be changed by modifying the volume of the mixed paste (and therefore of the preparatory pastes) is a simple conclusion which follows from the fact that said concentration is the ratio between the amount of acidic component and the volume of the mixed paste. In the Board's view, even in the absence of an explicit teaching in a prior art document, the skilled person would be able to draw this conclusion.

1.4.8 As to the argument that D6 proposes a different solution to the problem of preserving the stability of the preparatory pastes, namely to put some of the components in a dispersed phase, it is noted that D6 does not address the problem of increasing the bond strength of the cement composition which is an issue in the present case.

In any event, an obvious method does not become inventive for the sole reason that also other methods are suggested in the prior art.

1.5 For the above reasons the Board concludes that the main request does not comply with the requirement of Article 56 EPC.

Auxiliary request 1

2. According to claim 1 of this request the ratio of the first paste to the second paste is in the range from 1.5:1 to 20:1 whereas according to the main request it is 1.05:1 to 20:1.

2.1 This amendment of the mixing ratio does not change the assessment of inventive step presented above in respect to claim 1 of the main request. Indeed the appellant-patent proprietor did not present any specific argument with regard to the inventive step of auxiliary request 1.

Hence, the Board concludes that auxiliary request 1 does not comply with the requirement of Article 56 EPC.

Auxiliary request 3

3. Claim 1 of auxiliary request 3 differs from claim 1 of the main request in two features:

(a) the mixing ratio of the two pastes is comprised in the range 2:1 to 20:1 (by volume)

(b) the two pastes are stored in the two barrels of a special syringe characterised in that the cross-sectional area of the first syringe barrel containing the first paste to the second syringe barrel containing the second paste is in the range of 2:1 to 20:1 (by volume).

3.1 For the reasons provided in respect to claim 1 of the main request, using a higher volume of the first paste containing the acidic component in respect to the second paste does not involve any inventive activity.

The fact of specifying that the mixing ratio is at least 2:1 (whereas in claim 1 of the main request was at least 1.05:1) does not affect the validity of this conclusion. Thus, feature (a) (see point 3 above), does not provide any inventive contribution to the subject-matter of claim 1 of auxiliary request 3.

3.2 Concerning feature (b) (see point 3 above), D7 and D9 are the most relevant documents to be considered in combination with D5.

D7 relates to a device for mixing and dispensing dental impression materials. According to the embodiment described in column 7, lines 4 to 7 and Figure 7, the dispenser can be a syringe having two compartments of different volume.

D9 describes a kit for the production of a dental cement composition. The kit of Figure 3 comprises two cartridges for the storage of the pastes. As explained in page 2 (lines 17, 18), the ratio of the cross-sectional areas of the first cartridge to the second cartridge corresponds to the desired mixing ratio of the two pastes. The composition of the two pastes is described in the paragraph bridging pages 1 and 2 of D9. This composition is different from the two-part dental composition defined in claim 1.

The technical problem solved by feature (b), is to provide a system for storing and mixing the two preparatory pastes of the dental cement composition.

3.3 It is not disputed by the appellant-patent proprietor that document D7 and D9 describe the same type of device defined in claim 1 of auxiliary request 3.

In its opinion however, the skilled person would not consider the teaching of these documents in combination with D5, since the devices of D7 and D9 are used for storing and mixing different compositions compared to the compositions of D5 or to the compositions of auxiliary request 3.

3.3.1 In the Board's view this argument of the appellant-patent proprietor is not convincing.

The devices described in D7 and D9 are characterised by the presence of two compartments (syringe barrels in D7, cartridges in D9) of different cross-sectional areas. This arrangement permits to mix the pastes stored in the two compartments in different volumes. The skilled person would recognise that this functionality is independent from the chemical composition of the two pastes or from the use of the mixed composition. He would therefore consider obvious to use devices of the same types of those described in D7 and D9 also for preparing the dental cement compositions of the present request.

3.4 As a further argument, the appellant-patent proprietor submits that the features defining the mixing ratio and the syringe are inextricably linked and should therefore be considered together in the assessment of inventive step.

3.4.1 In this regard the Board observes that the two preparatory pastes can be stored, delivered and mixed also without the syringe defined in auxiliary request 3. Indeed claim 1 of the main request and of auxiliary request 1 do not contain any restriction as to the device for storing, delivering and mixing the preparatory pastes. Furthermore, the syringe does not

affect the properties of the two-paste composition and it does not interact synergistically with the feature concerning the mixing ratio in solving the problem of improving the bond strength without impairing the stability of the paste components.

The dual syringe is only a suitable device for storing, delivery and mixing the two pastes in different volumes. Thus, providing such a device is a problem that can be treated separately from the problem concerning the the bond strength of the cement composition.

3.5 In the decision under appeal, the opposition division observed that the materials used with the device of D7 are normally used in larger amounts compared to the two-paste composition defined in claim 1. Accordingly, the device of D7 could not have been used for the two-paste composition of claim 1 without previously adapting its size.

3.5.1 In this regard the Board considers that the mere adaptation of the size of a known device is an activity that does not involve an inventive step, unless it is shown that some particular technical difficulties are involved in the preparation of a device of reduced size. However, the appellant-patent proprietor did not provide any convincing argument in that respect. In this regard it is also noted that the description of the patent-in-suit does not provide any detail as to the fabrication of the dual syringe defined in claim 1. There is also no indication that for this fabrication some specific technical obstacles have to be surmounted. The few information provided in the description with regard to the dual syringes rather suggests that these devices were known at the priority

date of the patent and commonly used in the field of dentistry.

3.6 In the light of these considerations, the Board concludes that claim 1 of auxiliary request 3 does not fulfil the requirements of Article 56 EPC.

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:

S. Fabiani J. Riolo

Decision electronically authenticated