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File No.: T 0574/91 - 3.3.2  
Application No.: 82 302 153.0  
Publication No.: 0 064 834  
Classification: A61K 6/00  
Title of invention: Dental adhesive system

**DECISION**  
of 3 August 1993

Applicant:

Proprietor of the patent: DENTSPLY INTERNATIONAL, INC.

Opponent: 01) Blendax GmbH  
02) Bayer AG, Leverkusen Konzernverwaltung RP  
Patente Konzern  
03) Ivoclar AG  
04) Espe Stiftung & Co. Produktions- und  
Vertriebs KG

Headword: Dental Adhesive/DENTSPLY

**EPC:** Art. 56, 108, 114(2); R. 64

Keyword: "Admissibility (yes); review of revocation grounds" - "Late-  
filed experiments; disregarded" - "Inventive step (no); obvious  
modification"

**Catchwords**

*In the absence of specific objections in the Statement of Grounds, the  
appeal in this case is limited to a review of the grounds of revocation of  
the patent in suit.*



Case Number: T 0574/91 - 3.3.2

**DECISION**  
**of the Technical Board of Appeal 3.3.2**  
**of 3 August 1993**

**Appellant:**  
(Proprietor of the patent) DENTSPLY INTERNATIONAL, INC.  
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**Respondent:**  
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**Respondent:**  
(Opponent 03) Ivoclar AG  
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.../...

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office dated 19 February 1991,  
posted on 11 June 1991 revoking European patent  
No. 0 064 834 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** P.A.M. Lançon  
**Members:** I.A. Holliday  
E.M.C. Holtz

### Summary of Facts and Submissions

- I. European patent No. 0 064 834 was granted on the basis of 14 claims contained in European patent application No. 82 302 153.0.
- II. Four oppositions were filed against the granted patent, citing *inter alia* the following documents:
- (1) US-A-3 986 261
  - (2) DE-A-2 419 887
  - (3) Caulk Mastique Lamination Veneer System (commercial literature of the Appellant)
  - (5) Killian, Photocuring of Dental Materials, (American Chemical Society, March 1980).

The Opposition Division revoked the patent on the grounds of lack of inventive step, considering both method Claim 1 and composition Claim 14 to be novel. In particular, it was decided that the allegations of prior use raised by Opponents (3) and (4) were not substantiated.

In judging inventive step, the Opposition Division considered document (2) to be the closest state of the art in respect of the composition claims. Example 14 of (2) relates to a composition having all the features of Claim 14 of the main request except that the filler content exceeded 70% by weight. However, the description on page 15 of (2) indicated possible filler contents of 10 to 90%, even the preferred range of 60 to 80% by weight overlapped with the range of the patent in suit. In the view of the Opposition Division, this was evidence against the presence of inventive step.

The Opposition Division considered that Claim 1 amounted to a method of adhering glass or porcelain, i.e. materials well known in dentistry, to a tooth using an adhesive composition shown to be non-inventive. Since (2) also relates to contacting and exposure to visible light, such a method was also considered to lack inventive step.

The features of the two auxiliary requests, namely treatment with a silane coupling agent (first auxiliary) and a limitation to a filler content of 40 to 70 % were considered to be known and conventional in the art and accordingly not capable of substantiating inventive step.

III. The Appellant lodged an appeal against the decision of the Opposition Division. The Statement of Appeal argued that the Opposition Division had missed the point in its decision, without analysing the decision under appeal. The Appellant maintained that the patent in suit was the first disclosure in dentistry of a photobonding technique in which visible light is transmitted to the adhesive layer through the article to be bonded. The high tensile and compressive strengths obtained were considered to be evidence in favour of inventive step. New Claims 1 to 8 were filed with the Statement of Appeal.

IV. Respondents (1), (2) and (4) questioned the adequacy of the Statement of Appeal and its admissibility. Decisions T 432/88 of 15 June 1989 (not published in OJ EPO) and J 22/86 (OJ EPO 1987, 280) were referred to.

Respondent (2) referred to document (3), first introduced by Respondent (3) and argued that the subject-matter of the patent in suit lacked novelty in the light of its disclosure.

V. Oral proceedings took place on 4 August 1993; the Appellant and Respondents (2), (3) and (4) were present.

VI. At the oral proceedings, the Appellant objected to the inclusion of document (3) in the state of the art having regard to the novelty objection raised by Respondent (2). It was argued that the declaration of Mr Francis as to the pertinent dates for the introduction of the veneer system could not be construed to mean that (3) was available to the public at the priority date of the patent in suit.

In respect of inventive step, the Appellant considered that document (1) was the closest state of the art since it also related to a method of adhering an article to a tooth. However, there were two essential differences between the process of (1) and that of the patent in suit. According to (1), ultraviolet radiation was used whilst the patent in suit uses visible light. In (1) a plastics veneer was adhered to the tooth whereas the patent in suit relates to the adhesion of glass or porcelain articles.

Whilst the Appellant acknowledged that document (2) disclosed similar compositions to those used in the patent in suit, there would have been no reason for the skilled person to combine the disclosure with that of document (1). Document (2) relates to compositions for filling teeth which have an essentially different rheology to the adhesive compositions required in the patent in suit; a composition for filling teeth must have a relatively stiff composition suitable for application with a spatula whilst an adhesive should be free flowing since it would normally be applied by a brush. The Appellant also argued that the skilled person would not be led to use a composition containing a high

proportion of filler as an adhesive, especially having regard to its use in films <25 µm in thickness.

Shortly before the oral proceedings (received in the EPO on 16 June 93), the Appellant filed, without any accompanying technical explanation, a set of comparative examples and tables.

The Appellant filed new Claims 1 to 8 at the oral proceedings (main request) together with three auxiliary requests.

VII. The arguments of the respondents at the oral proceedings may be summarised as follows.

The discussion was essentially limited to a consideration of inventive step. The rigid distinction between materials suitable as filling composition and adhesives was denied by the respondents. Respondent (4) drew the Board's attention to the paper by Killian (5), in particular the passage on page 421 indicating that only a "slight modification" of a composition known as a composite restorative for teeth, i.e. a filling composition, was necessary to adapt it for use as an orthodontic bracket adhesive, i.e. an analogous use to that of the patent in suit.

It was the respondents' opinion that the composition of Example 14 of (2) which contained filler of average particular size 4.4 µm would be suitable for layers <25 µm thick. If the skilled man wished to reduce the viscosity of the composition of Example 14, it would have been an obvious measure to reduce the amount of filler. Respondent (3) denied that a composition containing 70% by weight of filler, i.e. the maximum prescribed by the claims of the patent in suit, would be a free flowing material capable of application by brush.

It was pointed out that, as originally filed, the application also included the adhesion of plastics articles to teeth, no distinction being given to any different measures which might be necessary when working with glass or ceramics.

As far as the radiation is concerned, the respondents remarked that the preferred range of the patent in suit, 400 to 500 nm, was very much at the violet/blue end of the visible light spectrum and quite close to the UV radiation used in the process of (1). If document (1) is considered in association with document (3), it could be seen that the Appellant's process described in (1) had already been modified by using visible light.

Respondent (3) also raised the question of Article 123(2) in relation to the reference to a layer "at least in part less than 25 microns thick".

VIII. Claims 1 and 8 filed at the oral proceedings (main request) read as follows:

"1. A method of adhering an article to a tooth comprising:

coating a layer of an adhesive composition onto a surface of at least one of said article or said tooth, contacting the coated surface with a surface of the remaining one of said article and said tooth such that said surfaces of the respective article and tooth are separated by and in contact with said layer of adhesive, said adhesive comprising a binder resin, a diluent monomer, an initiator for initiating polymerization of said adhesive by exposure to light, and at least one filler material, and exposing to light at least a portion of the assembly of said article and said tooth separated by said adhesive layer, to permit light to be transmitted through said article onto said adhesive



composition and thereby adhere said surfaces of said article and said tooth to one another through the resulting polymerized adhesive layer, characterized in that the light is visible light, the article is glass or porcelain, the binder is selected from acrylated polyesters, acrylated polyester reacted with isocyanates and, hydroxyalkyl acrylic species reacted with isocyanates, the initiator comprises an alpha diketone and an amine reducing agent, the filler material comprises from 20% to 70% by weight of the adhesive and, the layer of adhesive, at least in part, is less than 25 microns ( $\mu\text{m}$ ) thick.

8. An adhesive for adhering an article to a tooth which comprises a binder resin, a diluent monomer, an initiator for initiating polymerisation of the adhesive on exposure to visible light and at least one filler material, wherein the binder resin is selected from acrylated polyesters, acrylated polyesters reacted with isocyanates and hydroxyalkyl acrylic species reacted with isocyanates, the initiator comprises an alphasdiketone and an amine reducing agent and the filler comprises from 20% to 70% by weight of the adhesive and the adhesive is usable in a layer less than 25 microns thick."

According to the first auxiliary request Claim 1 was modified to restrict the filler range to 40 to 70%.

The second auxiliary request corresponded to Claims 1 to 7 of the main request and the third auxiliary request to Claims 1 to 7 of the first auxiliary request; i.e. composition Claim 8 had been withdrawn in each case.

IX. The Appellant requested that the decision of the Opposition Division be set aside and the patent

maintained on the basis of the main request or the auxiliary requests in descending order.

The respondents requested that the appeal be dismissed.

### Reasons for the Decision

#### 1. *Admissibility of the appeal*

1.1 The Board considers the appeal to be admissible.

1.2 The admission of the appeal in the present case was, however, only possible on the basis that the notice of appeal together with the Statement of Grounds was interpreted to mean that the appellant had accepted all conclusions made in the decision under appeal, except the conclusion on which the revocation was based, i.e. the lack of inventive step. This interpretation was based on the fact that the decision under appeal contains a number of arguments, none of which were addressed in the appeal. The sole argument raised in the appeal lay outside the decision under appeal. If any objections had been raised against the content of the decision under appeal, according to the established jurisprudence of the Boards of appeal, it would have been essential that the Statement of Appeal set out the specific factual and legal reasons on which the Appellant relied (e.g. J 22/86, OJ 1987, 280 and T 432/88 of 15 June 1989, not published in the OJ EPO).

1.3 In the absence of such specific objections on the part of the Appellant, the appeal in this case is limited to a review of the grounds of revocation of the patent in suit. Accordingly, the point at issue in the present

appeal proceedings is that of inventive step, providing that the Board has no reasons to question the other reasons, according to Article 114(1) EPC.

2. *Admissibility of documents*

2.1 In the oral proceedings, the Appellant, however, objected to the inclusion in the state of the art of document (3), arguing that the affidavit by Mr Francis actually did not prove that this document had been available to the public before the priority date of the patent in suit. The Appellant insisted that the objection against (3) was implicit in the appeal, since document (3) was significant for the novelty question and the objection against the finding of lack of inventive step would be useless unless the invention was found to be new. This kind of implicit reasoning is exactly what is considered to be unacceptable.

2.1.1 Neither a respondent nor the Board is obliged to study the entire contents of the files or to analyse the possible arguments or relevant documentation in order to arrive at the Appellant's case. In this particular case, if the Appellant had meant to object to the decision under appeal in general or in part, Article 108 and Rule 64(2) EPC require that these objections be set out clearly in writing, with all relevant argumentation as to the significance of the facts and evidence for every issue to be reviewed in the appeal.

2.1.2 It is also to be noted that a Respondent (Opponent 2) in a response to the appeal, received in the EPO on 16 April 1992, referred to (3). It was incumbent upon the appellant to react without delay and make his objection known. Lacking this, the insistence in bringing this issue into the proceedings would have resulted in the oral proceedings having to be adjourned,

in order to give the respondents the proper opportunity to submit further evidence regarding the availability to the public of (3), and further oral proceedings having to be arranged at a later date, the Appellant running the risk of having to bear all extra costs in accordance with Article 104 EPC. This procedural state of the case was explained to the parties during the oral proceedings.

2.1.3 Independently of what has been said above, the objection could further be rejected for being late under Article 114, as well as for constituting abuse of proceedings (cf. T 534/89 of 2 February 1993, to be published).

2.1.4 Further, the Board would refer to four decisions recently handed down by the Enlarged Board of Appeal, G 7/91 and G 8/91 (OJ EPO 1993, pages 356 and 346, respectively) dealing with the effect of a withdrawal of the appeal, and G 9/91 and 10/91 (OJ EPO 1993, pages 408 and 420, respectively) on the extent of examination of oppositions, in which the fundamental issues concerning the nature of appeal, the position of parties and the principle of party disposition are addressed. The present Board would specifically refer to G 8/91, paragraph 7, in which it is pointed out that, whereas "the opposition procedure is a purely administrative procedure, the appeal procedure must be regarded as a procedure proper to an administrative court, in which an exception from general procedural principles, such as the principle of party disposition [ in German "Verfügungsgrundsatz" ], has to be supported by much weightier grounds than in administrative procedure." These decisions confirm the established jurisprudence that the appeal is of a different nature than proceedings before the Examining or Opposition Divisions.

2.1.5 The Enlarged Board decisions G 9/91 and G 10/91 focus on the notices of opposition under Rule 55(c) as constituting the framework for the extent of the examination of the opposition, even recognising that the patentee who stands to have his patent revoked is in a less favourable situation than an opponent who having had his opposition dismissed can always challenge the patent at the national level. However, the principle of equal treatment still demands that an appellant who is the patentee must also address all points in his appeal which in his opinion are to be examined in the appeal review. The minimum requirement in this respect is that it is made clear as early as possible that indeed objections are raised on matters of fact.

2.1.6 For the above reasons, the Board accepts document (3) as part of state of the art.

2.2 The report on comparative tests was received on 16 June 1993 without any technical explanation. Its significance was not appreciated either by the Board or by the Respondents. Accordingly, the Board has decided to disregard it in accordance with Article 114(2) EPC.

3. *Article 123 EPC*

3.1 Claim 1 of the main request differs from the claim considered by the Opposition Division essentially in that the reference to visible light has been shifted from the preamble to the characterising portion of the claim. The Board has no reason to differ from the conclusions reached by the Opposition Division in the first paragraph on page 8 of the contested decision; the requirements of Article 123 can be considered to be satisfied.

4. *Novelty*

4.1 Especially in the light of the question of admissibility set out above, the Board finds no reason to question the findings of the Opposition Division with respect to novelty, including the alleged prior public use.

5. *Article 52(4) EPC*

5.1 For the same reasons as set out in point 3.1 above, the Board does not propose to reopen the question of medical indication.

6. *Problem and solution*

6.1 The Board agrees with the view taken by the Appellant that document (1) can be regarded as the closest state of the art. The method disclosed in (1) also relates to adhering an article to a tooth, in particular a plastics facing.

6.1.1 Document (1) contains no great detail of the chemical nature of the materials used to bond the plastics facing to the tooth. Reference is made to applying a commercial dental sealant material, manufactured by the Appellant to both tooth and facing (column 7, lines 41 to 46) which is subsequently hardened by exposure to ultraviolet light to obtain a material of "porcelain-like quality" (column 7, lines 59 to 61). A dental filler material is then applied either to the facing or the tooth and the whole pressed together. The nature of the filler material is not given but reference again occurs to a commercial material made by the Appellant (column 3, lines 1 to 4). It is significant that although used to adhere the plastics facing to the tooth, the material is referred to as a "dental filler material". The emphasis in document (1) is on a cheap

process which avoids the expense of conventional crowns (column 2, lines 4 to 8 and column 4, lines 18 to 23).

6.2 In relation to (1), the problem to be solved can be seen in developing a composition and process suitable for bonding glass or ceramic articles to teeth.

6.2.1 The problem is solved by using the composition as set out in Claim 8 of the patent in suit and the method set out in Claim 1 thereof. In the light of the worked examples of the patent in suit, the Board is satisfied that the problem has been plausibly solved.

7. *Inventive step*

7.1 An essential difference between the patent in suit and the disclosure of document (1), is that visible light rather than ultraviolet is used in curing. As admitted by the Appellant himself at the oral proceedings, one skilled in the art would have known at the priority date of the patent in suit that ultraviolet radiation does not normally penetrate glass or porcelain. This would explain why document (1) concentrated on this use of plastics veneers and would have led to using curing methods other than ultraviolet when attempting to bond glass or porcelain to teeth.

7.2 From the paper by Killian (5), which is in the nature of a review article, it is apparent that ultraviolet and visible light curing systems proceed by related chemical mechanisms, differing mainly in the photoinitiator used (page 423). It is also to be noted that the range of visible light preferred in the patent in suit (400 to 500 nm; cf. page 4, lines 40 to 41) is quite close to the wavelength of the ultraviolet radiation mentioned in the second paragraph of (5).

7.2.1 Although the process described in document (3) is allegedly based on (1) (see final page of (3)), the use of visible light is recommended. Paragraph (9) of (3) refers to the use of a "PRISMA-LITE" curing unit, i.e. the same as that mentioned in Example 1, of the patent in suit (page 5, line 18). The Board is accordingly convinced that, at the priority date of the patent in suit, there was a strong movement towards the use of visible rather than ultraviolet light. This would be especially true when adhering a glass article since visible light is known to penetrate glass. It is also well known that thin layers of porcelain are translucent and thus capable of transmitting visible light.

7.3 When seeking to solve the problem set out above, the skilled person, knowing from (5) that compositions known as dental filling materials could be modified for use as dental adhesives (second paragraph of article) would be led to look into related fields.

7.3.1 Document (2) describes compositions suitable for dental fillings which are based on reaction products of polyurethane prepolymer and ethylenically unsaturated monomers capable of reacting therewith to yield polymerisable material containing at least two ethylenically unsaturated groups. The composition may contain 10 to 90% by weight of filler, the preferred range being 60 to 80% (page 15, lines 14 to 21). According to the paragraph bridging pages 20 and 21 of (2), the compositions may be cured using ultraviolet or visible light, the latter being preferred. It is thus apparent that (2) provides a further link between the use of ultraviolet and visible radiation and confirms the trend towards using visible light.

7.3.2 Example 14 of (2) employs a composition comprising:  
33.33 parts of an ethylenically unsaturated prepolymer



obtained by reacting a polyurethane prepolymer with 2(hydroxyethyl) methacrylate dissolved in 16.66 parts of methyl methacrylate; 170 parts of Ballotini glass beads having an average diameter of 4.4  $\mu\text{m}$ ; 5 parts of a solution of dimethylaminoethyl methacrylate (40%) and benzil (20%) in methyl methacrylate. In other words, as correctly pointed out by the Opposition Division, the composition contains all the components required by Claim 8 of the patent in suit but differs in that the content of filler is in excess of 70% by weight. Although such a composition might not have the right consistency to be used as an adhesive, it was agreed by all parties at the oral proceedings that, having regard to the average particle size of the filler, it would be capable of forming a layer <25  $\mu\text{m}$  in thickness.

7.3.3 The skilled person, who within the present context would be a chemist with a knowledge of polymer compositions, would know that the amount of filler present has a strong influence on the rheology of such a polymer composition. Compositions having a higher content of filler flow less readily than those with lower concentrations. Thus all that would have been necessary to adapt the composition of Example 14 of (2) for use as an adhesive, would have been to reduce the amount of filler and so arrive at the composition of Claim 8 of the patent in suit without involving an inventive step.

7.3.4 In the judgment of the Board, the same reasoning must apply to the composition of Claim 8 irrespective of whether a filler content of 20 to 70% by weight (main request) or 40 to 70% of the first auxiliary request is claimed. Both figures would have been arrived at in an obvious manner merely by reducing the amount of filler known from the composition of Example 14 of document (2).

7.3.5 Having arrived at the composition of Claim 8 (of either request), it remains an obvious measure to apply the adhesive claimed according to the method set out in document (1) to adhere a glass or ceramic article to the surface of a tooth. The incentive to use such a composition according to the method of (1) is especially strong having regard to the use noted in paragraph 6.1.1 above of a "dental filler composition" as adhesive. As outlined above, the choice of visible rather than ultraviolet radiation would have been in accordance with a trend known in dentistry at the priority date.

7.3.6 Having regard to the preceding paragraphs, both Claim 1 and Claim 8 of each of the requests lack inventive step and the appeal must be dismissed in respect of the main and the three auxiliary requests.

7.4 It might be added that, at least in respect of the composition claims, an identical conclusion would have been reached had the Board chosen to start from document (2) as closest state of the art. In this case, the problem to be solved would have been to adapt the compositions of (2) for use as dental adhesives. Bearing in mind the disclosure of document (5), the reasoning set out in paragraph 7.3.3 above would have led in an obvious manner to the compositions of Claim 8.



Order

For these reasons, it is decided that:

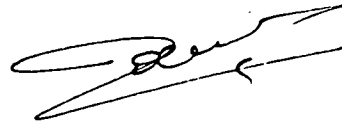
The appeal is dismissed.

The Registrar:



P. Martorana

The Chairman:



P.A.M. Lançon



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