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D E C I S I O N
of 6 October 1993

Case Number: T 0039/91 - 3.3.3

Application Number: 81902509.9

Publication Number: 0058203

IPC: C08L 1/26

Language of the proceedings: EN

Title of invention:

Non-dusting and fast-wetting impression material and method of preparing same

Patentee:

Dentsply International, Inc.

Opponent:

OII) Ivoclar AG
OIII) Mr Sueo Saito

Headword:

-

Relevant legal norms:

EPC Art. 54(2), 56

Keyword:

"Novelty (affirmed) - no implicit disclosure"
"Inventive step (affirmed) - no incentive to combine closest prior art with teachings of far-removed fields"
"No solution of the existing problem to be expected from combination with a document in related field"

Decisions cited:

T 0176/84, T 0195/84

Catchword:

-



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Boards of Appeal

Chambres de recours

Case Number: T 0039/91 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 6 October 1993

Appellant:
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office of 22 October 1990,
issued on 4 December 1990 concerning maintenance
of European patent No. 0 058 203 in amended form.

Composition of the Board:

Chairman: F. Antony
Members: R. Young
J.A. Stephens-Ofner

Summary of Facts and Submissions

- I. The mention of the grant of European patent No. 0 058 203 in respect of European patent application No. 81 902 509.9 filed on 26 August 1981 and claiming priorities of 26 August 1980 (US 181 417) and 17 August 1981 (US 293 143) was announced on 13 April 1988 (cf. Bulletin 88/15).
- II. Three Oppositions were filed on the grounds of Article 100(a) EPC, alleging lack of novelty and inventive step. One of the Oppositions (OII) additionally raised the ground of Article 100(b), alleging insufficient disclosure. The Oppositions were supported *inter alia* by the following documents:
- D1: GB-A-1 073 772;
 - D4: US-A-3 620 778;
 - D7: DE-A-2 314 516;
 - D8: CH-A-564 068;
 - D9: JP-A-54-24964, as well as a later filed full translation of D9 into English; and
 - D12: "Glycols" edited by Curme et al., Rheinhold Publishing Corporation, New York, USA, 1953; pages viii to xii and 278 to 281.
- III. By an interlocutory decision which was given at the end of oral proceedings held on 22 October 1990 and issued in writing on 4 December 1990 the Opposition Division held that the patent could be maintained in amended form on the basis of the set of four claims filed at the oral proceedings, Claim 1 of which read:
- "A dry powdered dental impression material composition adapted upon mixing with water to form a dental impression paste capable of setting to a solid,

comprising an alginic acid salt component and a filler component, characterized in that said powdered composition or at least a portion thereof is coated with a coating agent which is readily and rapidly wet, dispersed or dissolved by the water when the impression composition is mixed for forming the settable paste, said dry powdered impression material composition having reduced dusting characteristics as compared to the same composition absent the coating agent."

Dependent Claims 2 to 4 related to preferred embodiments of the material of Claim 1.

According to the decision, the subject matter claimed in the patent in suit met the requirements of Article 100(b) in that the patent contained sufficient description for carrying out the invention, and it was novel and inventive. It was novel over D1, since there, the water-soluble film-forming polymer was either a sachet or was in powdered form, rather than in the form of a coating of at least part of the powdered composition, and the wetting agent which was also disclosed would have resulted in a monomolecular coating providing no reduction of dusting. There was also novelty over D9, since that document did not relate to dental impression compositions of short setting time, and moreover the comparative tests filed were regarded as showing no significant reduction in dusting owing to the presence of the wetting agent.

As regards inventive step, the solution to the problem of reducing dusting and improving wettability on mixing with water as claimed in the patent in suit was not rendered obvious by cited prior art which related to technical fields totally different from dental impression materials.

IV. Notices of appeal were filed by all three Opponents. However the appeal of the Opponent OI was withdrawn without any grounds of appeal having been filed (letter dated 14 February 1991).

In the grounds of appeal filed by the remaining Appellants (Opponents OII and OIII) and their subsequent submissions to the Board, essentially the following arguments were put forward:

- (i) Since Claim 1 left the nature and quantity of the coating agent, as well as the manner of its application fully open, it represented a problem without a solution and to this extent was open to objection under Article 100(b) EPC.
- (ii) With regard to D9, its wetting agent and the coating agent of the patent in suit were the same substances, and the comparative tests of October 1990, using comparable particle sizes, showed a mathematically significant reduction in dusting; hence, in the absence of any amounts for the coating agent indicated in Claim 1, the latter lacked novelty over D9.
- (iii) With regard to D1, the "film forming" polymer thereof would presumably form a film, i.e. a coating, especially when its molecular weight was low, so that it was a liquid. There was therefore no novelty. Alternatively, when the polymer was a powder, powder coating of the other ingredients would take place. The conventional wetting agent would in any case form a coating.

- (iv) According to D4, the additives were applied by spraying and, therefore, would also form a coating, resulting equally in lack of novelty.
- (v) There was also no inventive step, in view of prior art in broader and neighbouring fields of technology, where similar dusting problems had been solved in essentially the same way; for instance, as disclosed in D7.

The Appellants also sought to introduce a large number of additional documents at the appeal stage.

The Appellants requested that the decision under appeal be set aside and the patent in suit be revoked.

V. The Respondent (Patentee) on the other hand relied mainly on his submissions during the proceedings before the Opposition Division.

In his submission dated 28 September 1993, he emphasised that dental impression materials had to satisfy a large number of requirements and could not, therefore, be compared with compositions in different fields of technology. He dismissed the late filed citations as adding nothing of importance compared with D1.

The Respondent requested that the appeals be dismissed, or alternatively that the patent in suit be upheld on the basis of the claims of the first, second or third subsidiary request filed during the oral proceedings which were held before the Board on 6 October 1993.

VI. At the oral proceedings, the Board indicated its willingness to admit the following by reason of their sufficient relevance:

D13: Journal of the Japan Research Society of Dental Materials & Appliances, No. 23, February 1971, pages 35 to 36;

D14: JP-A-53-96027 in the form of its English translation (but without Example 2 as post filed after the priority date of the patent in suit); and

D15: US-Re. 23 700, reissued 18 August 1953.

Reasons for the Decision

1. The appeals are admissible.

Main Request

2. *Admissibility of amendments*

Claim 1 of the main request is supported by Claim 1 as filed in conjunction with the opening paragraph of the description as filed, which refers to "impression materials, particularly for dental applications".

The remaining amendments (see Claim 3) are essentially typographical.

Consequently there are no objections under Article 123(2) or (3) EPC.

3. *Interpretation of Claim 1*

Claim 1 requires that the powdered composition or at least a portion thereof is coated with a coating agent. The claim is, in the Board's view, entitled to be interpreted in the light of the description, according to which it is the constituent (individual) powdered particles, or at least a portion thereof, preferably at least the filler, which are coated (see page 2, lines 45 to 49 in conjunction with lines 30 to 33).

4. *Sufficiency*

4.1 As far as the definition of the coating agent is concerned, the Board concurs with the reasoned view expressed in the decision under appeal, according to which the functional definitions were not objectionable since the whole opposed patent contained sufficient description for carrying out the invention (cf. Reasons for the decision, paragraph 3, last two sentences).

4.2 The objection made at the oral proceedings that the use of glycols as coating agents was unsuitable because of their allegedly poisonous character cannot be accepted. Although such substances are prohibited in products for human consumption, for instance in wines, only very small quantities will generally be present in a dental impression material, and a dental impression material is furthermore not intended for human ingestion.

Consequently, no objection arises under Article 100(b) EPC.

5. *The technical problem*

The patent in suit is concerned with a dry powdered dental impression material composition adapted upon mixing with water to form a dental impression paste capable of setting to a solid, comprising an alginic acid salt component and a filler component (cf. Claim 1).

5.1 Such compositions have been known in the art since about 1938 (see Respondent's submission dated 6 November 1989, page 1). Their use involved the proper measuring and then mixing of components thereof with water, proper measuring being essential to obtaining satisfactory physical properties. It had been the practice, before mixing the powdered components, vigorously to shake the container in which they had been stored, to "fluff" them. This shaking, however, tended to cause dusting when the container was opened and also when the powdered components were mixed with water. The dusting, which occurred primarily when a portion of the filler in the powdered components separated from the remaining powdered components and became airborne upon mixing or shaking, was a cause of inconvenience, and lately a cause of concern because of its potential health hazard (cf. patent in suit, page 2, lines 14 to 38).

According to D1, which also recognised the problem of dusting, and which by common consent is the closest state of the art, a dental impression material of improved flexibility and elasticity as well as of improved presentation comprised a water-soluble alginate together with a gelling agent therefor, and further contained 2 to 25 wt% of water-soluble, film-forming organic polymer (cf. page 1, lines 48 to 57; Claim 1).

Whilst the film-forming polymer could be incorporated in the remainder of the dental impression material in powdered form, it was much preferred to provide it in the form of an individual envelope containing the remaining ingredients of the dental impression material. The envelope could be formed and/or closed by welding, thus permitting individual packages to be dispensed, one or more of which could be dropped into a given amount of water and stirred after the envelope had dissolved, taking about $\frac{1}{4}$ to $\frac{3}{4}$ minute (see page 1, line 82 to page 2, line 13).

This envelope or sachet could contain a mixture of kieselguhr, sodium alginate, calcium or lead salt (gelling agent) together with minor ingredients regulating the pH and setting speed such as zinc or magnesium oxide and sodium carbonate or phosphate, together with pigments, and flavouring agent. A commercial dental impression material would generally include, in addition to the other components, a wetting agent such as "Cetrimide" (see page 2, lines 30 to 38 and 88 to 101).

5.2 Compared with this state of the art, the technical problem could be seen as the search for an alternative way of reducing the dusting propensity whilst improving the wettability of the powdered composition on mixing with water, without impairing the other important characteristics of the dental impression material.

5.2.1 In this connection the nature of the disadvantages associated with the dusting problem has to be borne in mind. Their impact is essentially on the personal comfort and even health of the operator (cf. D1, page 1, lines 54 to 57; patent in suit, page 2, lines 30 to 33). Clearly, for any attempted solution

to be effective, it must involve a substantial reduction in the level of dusting, if not its complete elimination.

5.2.2 The solution, according to Claim 1 of the patent in suit, was to dispense with the envelope or sachet and instead coat the individual particles of the powdered composition, or at least a portion thereof, with a coating agent which was readily and rapidly wet, dispersed or dissolved by the water when the impression composition was mixed for forming the settable paste, so that the dry powdered impression material composition had reduced dusting characteristics as compared with the same composition absent the coating agent.

5.2.3 The results of the Examples in the patent in suit in which the filler was coated show that the level of dusting was reduced by a minimum of two thirds and up to about 97%, depending on the choice of coating agent. The wetting time when mixed with water was 5 seconds compared with 10 seconds for a similar control composition not having the coating (Example 3) and 15 to 45 seconds for a sachet according to D1 (cf. page 2, lines 126 to 128). Furthermore, the products nevertheless complied with an official Specification for Alginate Impression Material (cf. Example 4).

A reduction in dusting by more than two thirds compared with an uncoated composition is considered to be substantial. The reduction in wetting time is in any case a significant improvement over the closest state of the art. The other desirable properties of the compositions were evidently retained. Thus the Board finds it credible that the technical problem is solved by the claimed measures.

6. *Novelty*

6.1 According to D9 an impression material for modelling objects larger than a denture, e.g. a hand or foot, contained, as a main component, an alginate complex material (3/10 to 8/10 neutralised by Na, K or Mg, and the rest by a salt of a di- or more-valent metal other than Mg). In addition to other components, such as calcium sulphate, soda ash, diatomaceous earth, calcium carbonate and sodium borate, the composition could comprise "small amounts" of "wetting agent, colouring matter, perfume and pH indicator" (cf. Claim 1).

In Example 1, 0.1 pbw ethanolamine in 793 pbw composition, and in Example 2 an unspecified "small amount" of propylene glycol in 706 pbw composition were present as wetting agent. The product was put in a two-litre container and mixed with 1600 cc water to give a product in a uniform syrup state, into which the hand was inserted. In about 4 to 5 minutes, the product started to set, and it formed a gel in a further 3 to 4 minutes.

6.1.1 It is more than doubtful whether D9 can be said to relate to a dental impression composition as claimed in the patent in suit, because it is explicitly stated to be for modelling objects larger than a denture (sentence bridging pages 1 and 2 of full translation); moreover the setting time of 7 to 9 minutes is far too long for the composition to be tolerated in the mouth of a dental patient.

6.1.2 Neglecting this point for a moment in favour of the Appellants, however, the question arises - since there is no explicit disclosure of any of the powder particles being coated - whether the "small" amounts

of wetting agent would have been sufficient to provide an effective dust-reducing coating in the sense of the patent in suit.

According to comparative tests filed by the Respondent on 6 November 1989, in which Examples 1 and 2 of D9 were reworked both with and without inclusion of the wetting agent, all four comparisons gave similar (high) levels of dusting, indicating the lack of any coating effect.

- 6.1.3 The counter experiments filed by the Appellant OIII on 16 October 1990, together with the statistical analysis of the results filed on 5 January 1993, on the other hand, although showing much lower absolute levels of dusting, allegedly showed a mathematically significant reduction in dusting in the presence of the small amounts of wetting agent.

A closer examination of the results of the counter experiments, however - in which the effects of increasing the amount of wetting agent from the level disclosed in D9 were investigated - shows that even if one accepts the mathematical significance of the results based on the statistical analysis of the Appellant - and this was challenged by the Respondent - the reductions in dusting were exceedingly small. Thus, using triethanolamine at a level of 0.05 wt%, a dust index of 6.4 mg/m³ min. was obtained, as compared with 7.7 mg/m³ min. for the same composition without wetting agent (cf. Exhibit B; table of results). Allowing for the quoted uncertainty values, however, (0.2 in the case of the first quoted figure, and 1.0 in the case of the second) this could be as small as 0.1 in 7.7, i.e. about 1.3% reduction in the dusting.

Moreover, the amount of triethanolamine wetting agent added according to Example 1 of D9 would correspond to about 0.0125 wt% of the composition, i.e. well under one half of the lowest quantity tested by the Appellant. The reduction in dusting to be expected from such a tiny amount of wetting agent would therefore presumably have been correspondingly smaller still.

Similar considerations must be taken to apply to Example 2 of D9, where the "small" amount of propylene glycol present was not further specified.

6.1.4 Such a minimal reduction in dusting cannot be regarded as corresponding to an effective solution to the technical problem, in view of the considerations set out in section 5.2.1 above.

6.1.5 Evidently, the levels of wetting agents thus conventionally added ("wetting" levels) were far lower than those necessary to reduce dusting ("coating" levels).

Consequently, D9 does not disclose a dust reducing coating of the powder particles as required by Claim 1 of the patent in suit. The subject-matter of Claim 1 therefore has novelty over the disclosure of D9.

6.2 Similarly to the situation in D9, there is no explicit reference in D1 to any of the individual particles being coated. The question to be determined in relation to novelty is thus solely whether there is any implicit disclosure of such coating.

6.2.1 The relevant passage in D1 reads "Whilst the film-forming polymer can be incorporated in the remainder of the dental impression composition in

powdered form, it is much preferred to provide it in the form of an individual envelope containing the remaining ingredients of the dental impression material" (see page 1, line 82 to page 2, line 6).

Thus there are two embodiments disclosed: (i) the envelope (sachet), and (ii) the incorporation "in powdered form".

6.2.2 The embodiment (i) clearly does not involve coating the individual powder particles as required by Claim 1 of the patent in suit.

6.2.3 As regards the embodiment (ii), two different interpretations of the phrase "in powdered form" were canvassed: (a) as meaning that the film-forming polymer itself was incorporated in powder form, and (b) as referring simply to the state of the remaining ingredients of the dental impression material.

The correct interpretation in the Board's view is (a), not only on the natural reading of the passage but also since (b) would involve a redundancy, the remainder of the composition already having been formally defined in D1 as being a powder (cf. page 1, lines 25 to 28). Interpretation (b) would also mean that the film-forming polymer was incorporated in some unspecified form.

6.2.3.1 The assertion that "powder coating" of the remaining powder particles by the "film-forming polymer" would necessarily take place, corresponding to interpretation (a), is unsupported by any evidence, and was indeed contradicted by the uncontested results of the comparative experiments of the Respondent, filed on 10 April 1986. These show that incorporation of the film-forming polymer polyvinyl alcohol in

powdered form in a dental impression material generally similar to those exemplified in the patent in suit failed to reduce dusting, whereas actually coating one of the powdered components with the same amount of polyvinyl alcohol according to the teaching of the patent in suit produced over two-thirds reduction in dusting.

- 6.2.3.2 The alternative argument, that the incorporation of a polyethylene oxide, which was disclosed as one of the coating agents in D1, if it were of low enough molecular weight to be liquid, would inevitably coat the powdered components, corresponding to interpretation (b), is also unconvincing, because D1, although disclosing polyethylene oxide, did not disclose the incorporation of a polyethylene oxide of any particular molecular weight (cf. page 2, line 79; Claim 9).
- 6.2.3.3 Similarly, the argument, that since the "incorporated" polymer was a "film-forming polymer" it would necessarily have formed a dust-reducing film, is also not convincing, since the term "film-forming" merely refers to a capability of the polymer, not to the way it functions under all circumstances.

Thus whichever of the two interpretations is taken, there is no ground for concluding that a coating of the remaining ingredients by the film-forming polymer would inevitably have taken place.

- 6.2.4 Finally, the argument that the wetting agent "Cetrimide" must necessarily have coated the particles and thus reduced dusting, was not supported by any evidence. In D1 "Cetrimide" is only mentioned as being a component of a "commercial dental impression material" (cf. page 2, lines 88 to 105). No quantity

is given, and it is not even stated specifically to be an ingredient of the composition placed in a sachet according to the Example of D1. On the contrary, a "commercial dental impression material", would normally be understood as a state of the art composition, and as such to exhibit all the problems of dusting.

Even if "Cetrimide" were present as an incidental ingredient, there would have been no reason for adding it in quantities greater than the "wetting" levels disclosed in the art. As has been shown above in relation to D9, however, such a quantity would have been insufficient to result in a dust-reducing coating (cf. sections 6.1.2 to 6.1.5 above).

Consequently, there is no disclosure, whether explicit or implicit, of a dust-reducing coating of individual powder particles occurring in D1.

Novelty is therefore established in relation to D1.

6.3 According to D4, polymeric substances having elastomeric and plastic properties were dispersed in amounts of 0.5 to 5 wt% in the form of aqueous suspensions in dental compositions containing calcium sulphate (dental stone) or calcium sulphate and an alginate (dental impression material) dispersed in water together with a water insoluble inert inorganic filler, so as to improve the surfaces of dental impressions, and of casts and models made therefrom, and render the latter more precise with smoother and substantially non-chalky surfaces (cf. Claims 7 to 12 on the one hand and Claims 1 to 6 on the other hand).

According to one example, 4 cc of a polyvinylacetate emulsion was added to 75 g of dental stone (calcium

sulphate) in 23 cc of water and mixed by spatulation in the usual rubber or plastic mixing bowl (column 16, lines 24 to 37). A similar procedure could be applied to the dental impression composition (column 10, lines 23 to 44).

Thus, not only does the process according to D4 fail to result in the formation of a dry powder of reduced dusting characteristics, because the aqueous suspension was not applied until the point of making up the impression paste, but the fact that the polymer was applied in the form of an aqueous dispersion would have prevented such a possibility, since in the presence of water the dental impression material would have reacted to form a hardening paste.

Consequently, D4 does not disclose a powdered composition of reduced dusting characteristics according to Claim 1 of the patent in suit, and novelty is therefore given in respect of this disclosure also.

6.4 The remaining documents, in particular D13 and D15, which relate to other dental impression materials, do not come closer and, contrary to what was indicated at the oral proceedings (see section VI above) need not even have been admitted into consideration, for lack of sufficient relevance.

Consequently, the subject-matter of Claim 1 is novel.

7. *Inventive step*

It is necessary to consider whether the skilled person, starting from D1 and looking for an alternative way of reducing the dusting propensity of dental impression materials and improving their

wettability when mixed with water whilst retaining their other valuable properties would have hit upon the idea of abandoning the sachet containing the remaining components and replacing it by a coating on at least part of the particles of the composition.

7.1 D1 itself gives no hint in this direction, because the sachet, which is the embodiment evidently capable of solving the dusting problem, does so at the expense of longer wetting times, and there is no teaching of coating particles of the powder (cf. section 6.2 above).

7.2 This finding applies even more strongly to the other documents in the proceedings relating to alginate-based impression materials (D4, D9, D13, D15; cf. sections 6.1, 6.3, 6.4 above), which not only fail to teach coating of the powder particles but also fail to mention, let alone solve, the dusting problem.

Therefore there was no hint in the prior art relating to the field of dental impression material compositions to make the claimed modification.

7.3 It was, on the other hand, known to coat particles of various other materials with coating agents for the purpose of reducing dusting.

7.3.1 In this connection, it was known from D7 that dust-free powdered mixtures which contained the enzyme protease could be obtained by treating a protease-containing filter cake which had been dried to less than 10% solvent content and ground to a powder, with a non-volatile liquid or oily wetting agent such as liquid paraffin or polyethyleneglycol (MW 200-600), in an amount of 0.1 to 10 wt% of the

ground product (originally numbered page 5, last paragraph to page 6, first paragraph).

- 7.3.2 Furthermore, according to D8, a block copolymer of polyoxypropylene and polyoxyethylene (MW 1000-16000) was applied to a ground, anhydrous cationic dyestuff powder to render it non-dusting yet of improved wetting properties with water and unchanged dyeing properties (Claim 1; column 1, lines 39 to 43; column 4, lines 1 to 7).
- 7.3.3 Finally, it was known from D14 to treat calcined gypsum for making moulds for dental, restorative surgery with a wetting agent not containing water. The wetting agent could be ethylene glycol, propylene glycol, glycerin or methylcellosolve, and could be added in an amount of 0.5 to 10% by weight. According to Example 1, ten parts of ethyl alcohol were added to and mixed by shaking for an extended period with 500 parts of commercially available calcined gypsum. The resulting product was slightly wetted, could be handled with no dusting, and produced a setting state and a set state which was much the same as the starting gypsum.
- 7.4 Of these documents, D7 and D8 are in technical fields so far removed from that of dental impression materials that the skilled person, starting from D1 and confronted with the existing problem, would be unlikely, in his search for prior art pointing at a possible solution, even to come across them.

Thus the decision T 176/84 (OJ EPO 1986, 050), which is concerned only with "neighbouring" technical fields, is not applicable in the present case.

7.5 If the skilled person nevertheless happened to hit upon one of the above documents, he would - aware of the delicate balance of properties required for dental impression material - be deterred from considering such a teaching to be a useful pointer. The same goes for D12, mentioning polypropyleneglycols as antidusting agents only in connection with powdered dyestuffs.

7.6 The only reference which is in a technical field not so far removed that it might perhaps be considered (in the sense of T 176/84) is D14.

7.6.1 At least one of the coating (wetting) agents mentioned in D14 (propylene glycol) was, however, known to have been present in impression materials, but without solving the dusting problem (cf. section 6.1.3 above, last paragraph). On the contrary, in D9, for instance, a wetting agent was stated to act as a "reaction regulator" (cf. top of page 5).

7.6.2 Furthermore, the powder treated according to D14 (calcined gypsum) was a single substance, i.e a relatively simple, internally stable powder system.

The dental impression material powder according to D1 on the other hand was a latently reactive system of several dissimilar components which had to be intimately mixed and whose nature and quantity had to be precisely balanced, to ensure that when water was added, an impression paste of the required mechanical characteristics and the right setting time was formed.

7.6.3 Finally, in D14 the effect of the treatment was to leave the wetting properties "much the same as the starting gypsum" (page 3, last three lines, of the translation). This does not reveal a solution of the

existing technical problem insofar as it relates to wettability, since here an improvement is required (cf. section 5.2 above).

The skilled person would thus not only have been confronted with a technical problem which was far more complex and demanding than that solved by D14, but also with a coating material known to be ineffective for preventing dusting in a similar impression material, and a teaching which evidently failed to solve the existing problem in at least one of its essential aspects.

7.7 If, in spite of the above considerations, the teaching of D14 had nevertheless been combined with that of D1, the question arises of what the resulting combination would have involved. This is because the sachet of D1 not only solves the dusting problem, but also ensures the maintenance of the desirable properties of the dental impression material unimpaired, by holding the powdered components in undisturbed, intimate contact with each other.

7.7.1 The teaching of D14 does not, however, address this important aspect of the technical problem. In particular it does not contain any hint showing that the sachet of D1 could be done away with, and the particles even further "divorced" from one other by the application of an intervening coating, without impairing the functioning of the dental impression material.

Consequently, it would not have been obvious to replace the sachet of D1. On the contrary, any combined teaching would logically have had to involve coating the particles within the sachet.

7.7.2 Such a combination would not only have had an element of superfluity, however, since the dusting problem had admittedly already been solved by the sachet, but would have militated still further against the achievement of shorter wetting times (see also section 7.6.3 above), and could have had an unpredictable effect on the remaining properties of the composition, in particular its setting time (cf. section 7.6.1 above).

It would thus in any case not have provided a solution to the technical problem.

7.8 The arguments based on the decision T 195/84, (OJ EPO 1986, 121) relating to more general fields, cannot affect the outcome. In T 195/84, the effects of applying a known generally applicable cable drive system in a particular context (aircraft) were held to be immediately foreseeable by the skilled person (cf. Reasons for the Decision, paragraph 8.5). In the present case, however, the coating agents were not known to be generally applicable and the effects of applying them in different fields were anything but predictable (cf. section 7.6.1 above). Thus T 195/84 is not applicable to the situation in the present case.

7.9 All in all, therefore, it cannot be regarded as obvious to try, with any expectation of success, the technique of, say, D14, to solve the functionally unrelated and inherently more demanding problem arising from D1. Nor would such an attempt, logically applied, have led to a solution of the technical problem.

Thus the subject-matter of Claim 1 does not arise in an obvious way from the of the state of the art. On

the contrary, the solution provided by the patent in suit, involving physical and chemical separation of the powder particles by coating instead of their close mutual confinement in a sachet, is the exact opposite of that previously taught. The fact that it is successful even when only a portion of the particles is coated is even more unexpected.

7.10 The Board also considers it highly relevant that about thirteen years elapsed between the first teaching that dusting could be reduced in a dental impression material (cf. D1, 1967) and the priority date of the patent in suit (1980) when the same problem was solved in a quite different way.

8. The subject-matter of Claim 1 is therefore not only novel, but also involves an inventive step. Claims 2 to 4 by virtue of their appendancy to Claim 1 are therefore also by the same token directed to novel and inventive subject matter.

9. *Auxiliary Requests*

There is consequently no need to consider any of the auxiliary requests.

10. *Costs*

Although the admission by the Board at the oral proceedings of three late cited documents (see section VI above) would normally have led to a decision awarding costs against the party responsible (see T 611/90, OJ EPO 1993, 050), the fact that the parties did not rely on any of these documents in their further arguments, but instead acknowledged that they were no more relevant than those already in the

proceedings, meant that the extra outlay involved in considering them was minimal.

Consequently, the Board sees no sufficient equity reason for ordering a different apportionment of costs.

Order

For these reasons, it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:

E. Görgmaier

F. Antony