

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOEL D. OXMAN

Appeal No. 95-0992
Application 08/014,104¹

HEARD: MAY 5, 1998

Before GARRIS, WARREN and OWENS, *Administrative Patent Judges*.
OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of claims 1-4, 7, 9, 14, 15, 17, 21, 22 and 31, and refusal to allow claims 16 and 18 as amended after final rejection. Claims 33-38 have been indicated allowable, and claims 5, 6, 8, 10-13, 19, 20, 23-30 and 32 stand objected to as being dependent from a rejected

¹ Application for patent filed February 5, 1993.

claim.

THE INVENTION

Appellant claims a method and kit for obtaining high bond strength to a previously set dental amalgam (specification, page 3, lines 27-28). The method includes applying to the amalgam a primer and an adhesive, where the primer includes an oxidant which has an oxidation-reduction half-reaction electrode potential which is greater than the absolute value of that of the amalgam. The kit includes a primer which contains an oxidant having an oxidation-reduction half-reaction electrode potential greater than 0.8 volts. Claims 1 and 21 are illustrative and read as follows:

1. A method for adhering to or coating a dental metal, comprising the steps of:

applying to said dental metal adhesively effective amounts of a primer composition and an adhesive, wherein said primer composition comprises an oxidant having an EE oxidation potential greater than the absolute value of the EE reductant of said dental metal; and

hardening said adhesive.

21. A kit for adhering to or coating dental amalgam, comprising:

a primer comprising an oxidant having an EE oxidation potential greater than 0.8 Volts; and an adhesive, wherein upon hardening said adhesive is capable of providing an average measured shear strength of at least 7 MPa between said adhesive and dental amalgam.

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THE REFERENCES

Reference relied upon by the examiner

Stoner et al. (Stoner) 4,064,629 Dec. 27, 1977

References relied upon by appellant

The Chemist's Ready Reference Handbook 16.1-16.4 (Gershon J. Shugar et al. eds., McGraw-Hill 1990) (Chemist's Handbook).

CRC Handbook of Chemistry and Physics D-157 - D-159 (Robert C. Weast ed., CRC Press 1980) (CRC Handbook).

THE REJECTION

Claims 1-4, 7, 9, 14-18, 21, 22 and 31 stand rejected under 35 U.S.C. § 103 as being unpatentable over Stoner.

OPINION

We have carefully considered all of the arguments advanced by appellant and the examiner and agree with appellant that the aforementioned rejection is not well founded. Accordingly, this rejection will be reversed.

Stoner discloses that when the surfaces of a dental cavity are coated with a metallic film of a metal more positive than tin in the International Electromotive Series such as silver, gold, platinum, indium, copper, alloys thereof or alloys with a metal inert to the system, and then the lined cavity is filled with dental amalgam, the restoration produced is extremely resistant to corrosion and has a long lifetime compared to conventional

restorations (col. 3, lines 50-61). Stoner states that he believes that the improved corrosion results from mercury from the bulk of the amalgam diffusing into the metal of the lining and forming an alloy zone free of tin atoms next to the cavity surfaces (col. 3, lines 61-64). Since no tin atoms are present next to the cavity surfaces, Stoner states, there is no oxidation in this region (col. 3, lines 64-66).

Appellant's specification (page 5, lines 1-2) states that the primary components of dental amalgams include metallic mercury, silver and tin. The following table shows the potentials for oxidation-reduction half-reactions at 25°C for these elements taken from the CRC Handbook, pages D-158 to D-159. Following these potentials in the table are the potentials for platinum and gold, which are two of the elements disclosed by Stoner. The oxidation strengths increase in the downward direction in the table, as E° increases.

	E° (volts)
$\text{Sn}^{+2} + 2e^{-} = \text{Sn}$	-0.1364
$\text{Ag}^{+} + e^{-} = \text{Ag}$.7996
$\text{Hg}^{+2} + 2e^{-} = \text{Hg}$.851
$\text{Pt}^{+2} + 2e^{-} = \text{Pt}$	-1.2
$\text{Au}^{+} + e^{-} = \text{Au}$	1.68

The first three entries in the table indicate that an

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amalgam made of a mixture of tin, silver and mercury would have an EE no greater than 0.851. The examiner's position is that since platinum and gold have electrode potentials of -1.2 and 1.68 volts, respectively, which are greater than the absolute value of the EE of such an amalgam as recited in appellant's claim 1 and are greater than 0.8 volts as recited in appellant's claim 21, a primer which includes either of these metals would fall within the scope of appellant's claims (answer, page 6).

As explained on page 16.3 of the Chemist's Handbook, since the oxidation strengths of Pt^{+2} and Au^+ are greater than those of Sn^{+2} , Ag^+ and Hg^{+2} , Pt^{+2} and Au^+ may oxidize the amalgam elemental metals. Stoner does not disclose use of Pt^{+2} and Au^+ but, rather, discloses use of elemental Pt and Au (col. 3, line 55). Platinum can exist only in the 0, +2 and +4 valence states, and gold can exist only in the 0, +1 and +3 valence states. The examiner has not explained, and it is not apparent, how Pt or Au in the elemental (i.e., 0 valence) state can serve as an oxidant and thereby be reduced to a lower valence state. The oxidation-reduction half-reaction potentials relied upon by the examiner indicate that Pt^{+2} and Au^+ may serve as an oxidant, but do not indicate that Stoner's elemental platinum or gold may do so.

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For the above reasons, we conclude that the examiner has not carried his burden of establishing a *prima facie* case of obviousness of appellant's claimed invention.

DECISION

The rejection of claims 1-4, 7, 9, 14-18, 21, 22 and 31 stand rejected under 35 U.S.C. § 103 over Stoner is reversed.

REVERSED

BRADLEY R. GARRIS)	
Administrative Patent Judge)	
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CHARLES F. WARREN)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
TERRY J. OWENS)	
Administrative Patent Judge)	

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F. Andrew Ubel
3M Office of Intellectual Property Counsel
P.O. Box 33427
St. Paul, MN 55133-3427