

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* RUSSELL A. NEEFE

Appeal 2007-1366  
Application 90/005,090  
Technology Center 1700

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Decided: July 31, 2007

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Before RICHARD E. SCHAFER, TEDDY S. GRON and  
ADRIENE LEPIANE HANLON, *Administrative Patent Judges*.

SCHAFER, *Administrative Patent Judge*.

**DECISION ON APPEAL**  
**STATEMENT OF THE CASE**

1 Patentee appeals from the final rejection of Claim 1 in the  
2 reexamination of Patent 4,306,042. 35 U.S.C. §§ 134 and 306. We have  
3 jurisdiction. 35 U.S.C. § 6(b).

4 An examiner rejected Claim 1 under 35 U.S.C. § 103(a) as  
5 unpatentable over the combined teachings of Quaal,<sup>1</sup> Gaylord<sup>2</sup> and Tanaka.<sup>3</sup>

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<sup>1</sup> US Patent 3,377,371.

<sup>2</sup> US Patent 4,120,570.

<sup>3</sup> US Patent 4,235,985.

1 We affirm.

2 **FINDINGS OF FACT**

3 **Claimed Subject Matter**

4 F. 1. Patentee claims a method of making an oxygen permeable contact  
5 lens material.

6 F. 2. The method includes the step of copolymerizing certain comonomers  
7 in the presence of a free radical or photo initiator.

8 F. 3. These comonomers are

- 9 (1) 5-90 weight percent of a specific siloxanyl alkyl ester;  
10 (2) 3-90% of an ester of acrylic or methacrylic acid;  
11 (3) 0.05%-90% of a surface wetting agent and  
12 (4) an oxygen permeable multifunctional siloxanyl alkyl ester  
13 cross-linking agent.

14  
15 F. 4. The specific siloxanyl alkyl ester monomer is 1,1,1  
16 tris(methylsiloxy)methacryloxypropylsilane (hereinafter TRIS), a  
17 known siloxanyl alkyl ester having a known use in contact lens  
18 materials.

19 F. 5. In addition to the copolymerization step, Claim 1 also specifies the  
20 process for making TRIS.

21 F. 6. The specified steps for making TRIS include:

- 22 (1) mixing specified amounts of  
23 methacryloxypropyltrimethoxysilane (MAS) and  
24 trimethylchlorosilane (TMCS),  
25 (2) adding this mixture to a specified amount of water,  
26 (3) agitating this second mixture for a specified time,  
27 (4) allowing the mixture to separate,  
28 (5) removing and filtering the upper most layer and  
29 (6) subjecting the removed material to vacuum distillation.

30  
31 F. 7. Patentee's Claim 1 is reproduced below:

1           1.     A method of making an oxygen permeable material for  
2           the manufacture of contact lens by the synthesization of the  
3           monomer 1,1,1 tris(methylsiloxy)methacryloxypropylsilane (a  
4           siloxanyl alkyl ester) by the following procedures:  
5           (a)     a mixture is prepared having the relationship of  
6           one mole of methacryloxypropyltrimethoxysilane with  
7           three to forty moles of trimethylchlorosilane;  
8           (b)     the mixture is then added to water whose volume  
9           is from 3 to 10 times that of the mixture;  
10          (c)     agitation is maintained for 30 minutes to 48 hours;  
11          (d)     then allow the mixture to separate into layers,  
12          remove and filter the upper organic layer;  
13          (e)     the unwanted by-product (hexamethyldisilane) is  
14          then removed by vacuum distillation;  
15          (f)     forming an oxygen permeable contact lens material  
16          by copolymerizing from  
17                 5% to 90% by weight of the 1,1,1 -  
18                 tris(trimethylsiloxy)methacryloxy-  
19                 propylsilane prepared above;  
20                 3% to 90% by weight of an ester of acrylic or  
21                 methacrylic acid;  
22                 from 0.05% to 90% by weight of a surface wetting  
23                 agent,  
24                 from 0.01% to 90% by weight of an oxygen  
25                 permeable crosslinking agent selected from  
26                 the class of multifunctional siloxanyl alkyl  
27                 esters  
28           in the presence of a free radical or a photo initiator.

29           **Gaylord**

30    F. 8.   Gaylord relates to methods of making oxygen permeable contact lens  
31           materials.

32    F. 9.   Gaylord teaches forming a contact lens material by copolymerizing  
33           specified comonomers in the presence of a free radical initiator.

34           Gaylord, 1:52-56, 4:32-38

35    F. 10. The comonomers may include

- 1 (1) 10-70% by weight of siloxanyl alkyl ester (Gaylord,  
2 4:14-16);  
3 (2) 30-90% by weight acrylic or methacrylic acid ester  
4 (Gaylord, 4:14-16);  
5 (3) 0.01-10% of a surface wetting agent (Gaylord, 5:39-46); and  
6 (4) 0.01%-2% a cross-linking agent (Gaylord, 6:3-12.)  
7

8 F. 11. Gaylord teaches TRIS as a preferred siloxanyl alkyl ester. Gaylord,  
9 Examples 1-7 and 22-23.

10 F. 12. Gaylord characterizes the described contact lens materials as having  
11 “vastly increased oxygen permeability” as compared to  
12 “conventional” contact lens materials. Gaylord, 4:57-59.

13 F. 13. Gaylord describes cross-linking agents including “polyol acrylic  
14 ester[s] of higher functionality.” Gaylord, 6:3-12.

#### 15 **Differences Between Gaylord and the Claimed Invention**

16 F. 14. Patentee characterizes his invention as “an improvement over the  
17 Gaylord method of making contact lens materials.” Neefe  
18 Declaration, filed January 19, 2001, p. 1, ¶ 2.

19 F. 15. Patentee states: “My invention was to substitute an oxygen-  
20 permeable crosslinker for the impermeable EGDMA used in the prior  
21 art.” Neefe Declaration, filed January 19, 2001, p. 2, ¶ 5.

22 F. 16. Gaylord does not teach the use of an oxygen permeable crosslinking  
23 agent selected from the class of multifunctional siloxanyl alkyl esters.

24 F. 17. Gaylord does not teach the specific method of making TRIS required  
25 by Patentee’s Claim 1.

#### 26 **Tanaka**

27 F. 18. Tanaka relates to oxygen permeable copolymers for use in contact  
28 lens materials and methods for forming those materials.

- 1 F. 19. Tanaka notes the importance of oxygen permeability of contact lens  
2 materials. Tanaka, 1:6-10.
- 3 F. 20. Tanaka notes that the utilization of comonomers having an alkylsiloxyl  
4 group is an available means of increasing oxygen permeability.  
5 Tanaka, 2: 60-63.
- 6 F. 21. Tanaka describes methods of making crosslinked oxygen permeable  
7 contact lens materials by copolymerization of certain specific  
8 comonomers.
- 9 F. 22. Tanaka teaches that the copolymers may be crosslinked in a  
10 conventional manner using a cross-linking agent added to the mixture  
11 prior to polymerization. Tanaka, 2:30-31, 7: 59-8:2.
- 12 F. 23. Tanaka says cross-linking agents of the type conventionally used in  
13 cross-linking vinyl monomers may be employed. Tanaka, 8: 2-10.
- 14 F. 24. Tanaka also teaches that multifunctional siloxyanyl alkyl ester cross-  
15 linking agents may be substituted for the conventional cross-linking  
16 agents conventionally used in polymerization of vinyl monomers.  
17 Tanaka 8:2-10.
- 18 F. 25. Tanaka also teaches that the preferred cross-linking agents are  
19 multifunctional monomers having siloxane bonds. Tanaka, 8:10-12.
- 20 F. 26. The preferred multifunctional monomers disclosed are multifunctional  
21 siloxyanyl alkyl esters having a siloxane bond corresponding to  
22 specified formulas referred to as Formulas [V] and [VI].  
23 Tanaka, 8: 11-34.
- 24 F. 27. Tanaka says these are preferred because the siloxane bonds provide  
25 high oxygen permeability to the cross-linked copolymer:

1                    Since these cross-linking agents of the general formulas  
2                    [V] and [VI] have siloxane bonds in their molecules, the  
3                    oxygen permeability of the obtained cross-linked  
4                    copolymers is high and, therefore, they are preferably  
5                    employed in the present invention.

6                    Tanaka, 8:35-39.

7                    F. 28. One having ordinary skill in the art would have understood Tanaka to  
8                    teach that the preferred multifunctional siloxyanyl alkyl ester cross-  
9                    linking agents contribute to the oxygen permeability of the contact  
10                    lens material. Tanaka, 8:35-39.

11                    **Quaal**

12                    F. 29. Quaal relates to the formation of “tris-siloxy acrylic silanes,” having  
13                    the general formula  $(R_3SiO)_3Si-R'-OOC(R'')=CH_2$ .

14                    F. 30. Quaal teaches a general method of forming these silanes by the  
15                    cohydrolysis of (1) compounds having the formula  
16                     $CH_2=C(R'')COO-R'-SiX_3$  with (2) an excess amount of compounds  
17                    represented by  $R_3SiX$ . Quaal, 1:25-28.

18                    F. 31. R, R', R'' and X are each defined as a variety of moieties.  
19                    Quaal, 1:16-36.

20                    F. 32. TRIS, MAS and TMCS are compounds meeting Quaal's general  
21                    formula and the formulas for the two reactants, respectively.

22                    F. 33. TRIS has the formula  $((CH_3)_3SiO)_3Si-(CH_2)_3-OOC(CH_3)=CH_2$  and  
23                    meets Quaal's definitions of R, R' and R'' where R is methyl (-CH<sub>3</sub>),  
24                    R' is the alkylene -(CH<sub>2</sub>)<sub>3</sub>-, R'' is methyl (-CH<sub>3</sub>).

25                    F. 34. MAS has the formula  $CH_2=C(CH_3)COO-(CH_2)_3-Si(OCH_3)_3$  and meets  
26                    Quaal's definitions of R', R'' and X where R' is the alkylene -(CH<sub>2</sub>)<sub>3</sub>-,  
27                    R'' is methyl (-CH<sub>3</sub>), and X is methoxy (-OCH<sub>3</sub>).

- 1 F. 35. TMCS has the formula  $(\text{CH}_3)_3\text{SiCl}$  and meets Quaal's definitions of R  
2 and X where R is methyl ( $-\text{CH}_3$ ) and X is Cl.
- 3 F. 36. Quaal teaches that the cohydrolysis is preferably carried out in a  
4 water-solvent mixture but the solvent is characterized as "not essential  
5 to the process." Quaal, 1:55.
- 6 F. 37. Quaal also teaches that the amount of water is not critical but should  
7 be sufficient to allow the reaction to proceed at a satisfactory rate.  
8 Quaal, 1:51-53.
- 9 F. 38. Quaal's Example 1 describes a method of making TRIS. Quaal 2: 3-  
10 33.
- 11 F. 39. Quaal's Example 1 describes the cohydrolysis of MAS, TMCS and a  
12 third compound  $(\text{CH}_3)_3\text{SiOCH}_3$  to form TRIS. Quaal, Example 1,  
13 2:4-30.
- 14 F. 40.  $(\text{CH}_3)_3\text{SiOCH}_3$  is also a compound having the formula  $\text{R}_3\text{SiX}$  meeting  
15 Quaal's definitions of R and X.
- 16 F. 41. A mixture of MAS, TMCS, and  $(\text{CH}_3)_3\text{SiOCH}_3$  is added to a mixture  
17 of water and ether and stirred overnight. Quaal, Example 1, 2:12-17.
- 18 F. 42. The mole weight of MAS is 248 grams.
- 19 F. 43. The mole weight of TMCS is 108 grams.
- 20 F. 44. The mole ratio of MAS (248 grams) to TMCS (325.5 grams) in the  
21 mixture is 1:3.0.
- 22 F. 45. The water was removed using a separatory funnel. Quaal, 2: 17-19.
- 23 F. 46. The remaining layer was washed and subject to vacuum drying and  
24 vacuum distillation to obtain TRIS. Quaal, 2: 25-28.
- 25 F. 47. The TRIS was apparently reasonably pure as indicated by the  
26 comparison of the theoretical percentages of C, H and Si with the

1 percentages that resulted from actually carrying out the process  
2 described in Example 1. Quaal, 2:31-33.

3 F. 48. Quaal's Example 4 identifies a number of different silane  
4 cohydrolysis combinations and their resulting products. Quaal, Table,  
5 columns 3-4.

6 F. 49. One having ordinary skill in the art would have understood that Quaal  
7 describes a general technique for forming a variety of tris-type silanes,  
8 including TRIS.

9 **The Level of ordinary skill in the art**

10 F. 50. The person having ordinary skill in the art was aware of the reasons  
11 for and desirability of high oxygen permeability in contact lens  
12 materials.

13 F. 51. The person of ordinary skill in the art would have fully understood the  
14 copolymerization chemistry used to make contact lens materials  
15 including the mechanism involved in cross-linking.

16 F. 52. One having ordinary skill in the art would have understood that cross-  
17 linking takes place through unstaturated ethylenic bonds ( $=\text{CH}_2$ ).

18 F. 53. The person having ordinary skill in the art would also have  
19 understood and been familiar with the processes and chemistry for  
20 making the comonomers that are copolymerized in making contact  
21 lens materials.

22 F. 54. One having ordinary skill in the art would have been familiar with the  
23 properties of TRIS and the chemistry necessary to make it.

24

**ISSUES**



1 considerations may also be considered to illuminate the circumstances  
2 surrounding the origin of the invention. *Graham*, 383, U.S. at 17-18.

3 **Analogous Art**

4 Analogous art includes references which are in the field of the  
5 applicant's endeavor or are reasonably pertinent to the problem with which  
6 the inventor was concerned. *In re Kahn*, 441 F.3d 977, 986-87. 78 USPQ2d  
7 1329, 1336 (Fed. Cir. 2006). The hypothetical person having ordinary skill  
8 in the art is presumed to be aware of all prior art in the field of the invention.  
9 *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir.  
10 1998).

11 **Combining Teachings**

12 Obviousness may be shown from the interrelated teachings of  
13 multiple patents. However, there must be a reason to combine the prior art  
14 elements in the way claimed. *KSR* 127 S.Ct. at 1741. In other words, there  
15 must be “some articulated reasoning with some rational underpinning to  
16 support the legal conclusion of obviousness.” *KSR*, 127 S.Ct. at 1741,  
17 quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed.Cir.  
18 2006). However, the obviousness analysis does not require that the prior art  
19 include precise teachings as to the subject matter of the claimed invention.  
20 Inferences and creative steps that a person of ordinary skill in the art would  
21 take may be considered. *KSR*, 127 S.Ct. at 1741. Under the analysis any  
22 need or problem known in the field of endeavor at the time of the invention  
23 and addressed by the prior art can be a basis to combine the teachings of the  
24 references. *KSR*, 127 S.Ct. at 1741. However when the prior art teaches  
25 away from combining certain known elements, discovery of a successful  
26 means of combining them is more likely to be nonobvious. *KSR*, 127 S.Ct.

1 at 1740. A prior art reference may be considered to teach away when “a  
2 person of ordinary skill, upon reading the reference, would be discouraged  
3 from following the path set out in the reference, or would be led in a  
4 direction divergent from the path that was taken by the applicant.” *In re*  
5 *Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed.Cir. 1994). But, a  
6 statement that a particular feature is not preferred does not teach away  
7 absent clear discouragement of that combination. *Syntex (USA) LLC v.*  
8 *Apotex Inc.*, 407 F.3d 1371, 1380, 74 USPQ2d 1823, 1830 (Fed. Cir. 2005).

9 **Secondary Considerations**

10 “Such secondary considerations as commercial success, long felt but  
11 unsolved needs, failure of others, etc., might be utilized to give light to the  
12 circumstances surrounding the origin of the subject matter sought to be  
13 patented. As indicia of obviousness or nonobviousness, these inquiries may  
14 have relevancy.” *Graham*, 383 U.S. at 18. Secondary considerations such  
15 as commercial success, long felt need, and copying by others must be proved  
16 with clear and convincing evidence. *In re Snow*, 471 F.2d 1400, 1404,  
17 176 USPQ 328, 331 (CCPA 1973); *In re Miegel*, 404 F2d 378, 381159  
18 USPQ 716, 717 (CCPA 1968); *In re Heyna*, 360 F2d 222, 228, 149 USPQ  
19 692, 697 (CCPA. 1966); *In re Lohr*, 317 F.2d 388, 137 USPQ 548, 550-551  
20 (CCPA 1963). To show unexpected results, a comparison of the invention  
21 with the prior art must be under identical conditions except for the novel  
22 features of the invention. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685,  
23 689 (CCPA 1972).

1 **Analysis**

2 **Claim construction**

3 In distinguishing certain portions of the prior art, Patentee argues that  
4 the process of Claim 1 prepares TRIS from only two reactants, MAS and  
5 TMS. Reply Brief filed June 16, 2003, pp 4-5: Reply Brief in Response to  
6 Supplemental Examiner's Answer filed September 9, 2005, pp. 6-7, footnote  
7 1, pp. 14-15. Patentee also distinguishes the claimed subject matter from the  
8 prior art by arguing that the claimed process does not include the use of a  
9 water-solvent mixture. Reply Brief in Response to Supplemental  
10 Examiner's Answer filed September 9, 2005, pp. 18-19, n. 9. We  
11 understand Patentee's position to be that the literal scope of the mixture  
12 employed to form TRIS in Claim 1 is limited to the mixture of MAS and  
13 TMCS and the inclusion of different or additional silanes is excluded. We  
14 also understand Patentee's position to be that the literal scope of Claim 1 is  
15 limited to the use of water as a solvent in making TRIS and that the use of  
16 other solvents such as ether is excluded.

17 Claims involved in a reexamination are ordinarily given the broadest  
18 reasonable construction. *Yamamoto*, 740 F.2d at 1571, 222 USPQ at 936.  
19 However, a narrowed construction is appropriate where the patent has  
20 expired, as is the case here. *Papst-Motoren*, 1 USPQ2d at 1656. The  
21 language of Claim 1 is susceptible to the narrow construction urged by  
22 Patentee and we adopt that construction.<sup>4</sup> *Pabst-Motron*, 1 USPQ2d at  
23 1656.

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<sup>4</sup> We express no view on what mixtures might infringe or are "encompassed by" the claims under the doctrine of equivalents. See Reply Brief in Response to Supplemental Examiner's Answer filed September 9, 2005, p. 7, n. 1 and accompanying text.

1 **Obviousness**

2 **Analogous Art**

3 Patentee argues, in effect, that Quaal is non-analogous art. Quaal is  
4 said to be non-analogous because Quaal does not relate to oxygen permeable  
5 contact lens materials. Analogous art includes references which are in the  
6 field of the inventor's endeavor or are reasonably pertinent to the problem  
7 with which the inventor was concerned. *Kahn*, 441 F.3d at 986-87, 78  
8 USPQ2d at 1336.

9 The field of Patentee's endeavor is making contact lens materials. As  
10 part of Patentee's claimed method of making contact lens materials, Patentee  
11 expressly includes the method of making the comonomer TRIS. Thus,  
12 methods of making TRIS are clearly part of the relevant field of endeavor.  
13 Further, Gaylord describes methods of making TRIS as well as other  
14 comonomers useful for making contact lens materials. Tanaka, while not  
15 describing TRIS as a comonomer, describes methods of making the  
16 comonomers used in the manufacture of contact lens materials there  
17 described. These teachings show that methods of making comonomers are  
18 part of the field of making contact lens materials. Quaal's teaching of a  
19 method of making the comonomer TRIS, a comonomer known to be used in  
20 contact lens materials, is part of the field of Patentee's endeavor. Quaal is  
21 analogous art. *Kahn*, 441 F.3d at 986-87, 78 USPQ2d at 1336.

22 Gaylord and Tanaka both relate to forming contact lens materials by  
23 copolymerization. They are part of the same art as the claimed invention.

24 Thus, Gaylord, Tanaka and Quaal are analogous art and part of the  
25 presumed knowledge of the person having ordinary skill. The hypothetical  
26 person of ordinary skill in the art is presumed to have knowledge of all prior

1 art in the field of the invention. *Rouffet*, 149 F.3d at 1357, 47 USPQ2d at  
2 1457).

3 **Combining Teachings**

4 Tanaka expressly teaches that multifunctional siloxyanyl ester cross-  
5 linking agents may be used in place of conventional cross-linking agents,  
6 such as ethylene glycol dimethacrylate, generally employed in the  
7 polymerization of vinyl monomers. Tanaka, 8:2-14. Tanaka also teaches  
8 that polyfunctional siloxyanyl ester cross-linking agents are preferred  
9 because the siloxane bonds in those molecules provide high oxygen  
10 permeability to the copolymer. Tanaka, 8:35-39. Thus, one having ordinary  
11 skill in the art would have recognized that the oxygen permeability of  
12 Tanaka's contact lens materials was due, in part, to the use of Tanaka's  
13 preferred cross-linking agents. The person having ordinary skill in the art  
14 would have been aware of the need for contact lens materials to have high  
15 oxygen permeability. This known need in the art gives a reason for a person  
16 of ordinary skill in the art to use Tanaka's preferred cross-linking agents.  
17 Any need or problem known in the field of endeavor at the time of the  
18 invention and addressed by the prior art can be a basis to combine teachings  
19 of the references. *KSR*, 127 S.Ct. at 1741. The person having ordinary skill  
20 in the contact lens art would have expected Tanaka's multifunctional  
21 siloxyanyl ester cross-linking agents to act as cross-linking agents for the  
22 comonomers used by Gaylord due to the presence of the terminal  
23 unsaturated carbons ( $=CH_2$ ). The conventional cross-linking agents taught  
24 by Gaylord and Tanaka, as well as Tanaka's multifunctional siloxyanyl ester  
25 cross-linking

1 agents, have terminal unsaturated carbons.<sup>5</sup> It would have been expected,  
2 and therefore obvious, to replace the conventional cross-linking agents  
3 described by Gaylord with the multifunctional siloxyanyl ester cross-linking  
4 agents preferred by Tanaka.

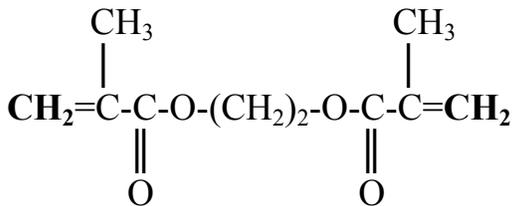
5 Patentee argues that Tanaka teaches away from using Tanaka's  
6 polyfunctional siloxanyl ester cross-linking agents with comonomers of the  
7 type used by Gaylord. Patentee argues that Gaylord's ester monomers do  
8 not have an internal glycerol group for increased hydrophilicity which  
9 monomers are taught by Tanaka as having undesirable water-repelling  
10 properties when used in contact lens material. Patentee also relies on two of  
11 Tanaka's 53 examples, Examples 29 and 42, as indicating that Tanaka's  
12 polyfunctional siloxanyl ester cross-linking agents actually decrease oxygen  
13 permeability.

14 Tanaka does not teach away.

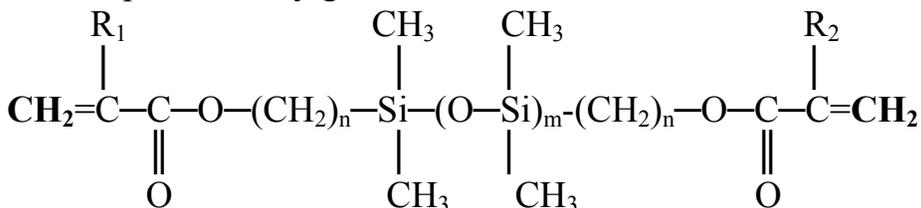
15 Tanaka provides ample reasons for using polyfunctional siloxanyl  
16 ester cross-linking agents with comonomers other than those specifically

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<sup>5</sup> Ethylene glycol dimethacrylate, described as crosslinkers by both Gaylord and Tanaka, may be represented by the following formula:



Tanaka's preferred cross-linkers similarly have terminal unsaturated carbons (=CH<sub>2</sub>). For example, Tanaka's preferred siloxanyl alkyl esters include those represented by general formula:



1 described by Tanaka. Tanaka teaches that the cross-linkers are a substitute  
2 for “known cross-linking agents generally employed in the polymerization  
3 of a vinyl monomer . . . .” Tanaka, 7:62-8:14. The cross-linking agents are  
4 taught to be preferred because they provide contact lens materials having  
5 good oxygen permability because of their siloxane bonds. Tanaka, 8:35-39.  
6 Lastly, the polyfunctional siloxanyl ester cross-linking agents are said to  
7 provide hydrophilic groups which are beneficial for the hydrophilic property  
8 of contact lens materials. Tanaka, 8:39-46.

9 We fail to see why the fact that Gaylord’s comonomers do not include  
10 an internal glycerol group would teach away from the use of the cross-  
11 linking agents taught by Tanaka. The person having ordinary skill in the art  
12 understands that the mechanism of cross-linking relies on the presence of the  
13 terminal unsaturated carbon bonds. The person having ordinary skill in the  
14 art would have expected that Tanaka’s preferred polyfunctional siloxanyl  
15 ester cross-linking agents, which also include terminal unsaturated carbons  
16 ( $=\text{CH}_2$ ), would also be effective cross-linking agents with Gaylord’s  
17 comonomers. We have not been directed to evidence in the record which  
18 shows the contrary.

19 With respect to the comparison of the oxygen permeability of  
20 Examples 29 and 42, we can not draw any conclusion from these examples.  
21 The two examples are not comparable because of the different amounts of  
22 organosiloxane comonomer. The contact lens material of Example 29 is a  
23 copolymer said to have been made from **40** grams of an organosiloxane  
24 comonomer designated S<sub>3</sub>, 50 grams of methylmethacrylate (MMA) and 10  
25 grams of a polyfunctional siloxanyl ester cross-linking agent, TMSBPGMA  
26 (tetramethyldisiloxanylbis (propylglycerol methacrylate)). The oxygen

1 permeability of this composition was said to be  $6.3 \times 10^{-10}$ . The contact lens  
2 material of Example 42 is a copolymer made from **50** grams of S<sub>3</sub>, 43 grams  
3 of MMA and 7 grams of conventional cross-linking agent ethylene glycol  
4 dimethacrylate (EDMA).<sup>6</sup> The oxygen permeability of the Example 42  
5 copolymers is said to be  $9.6 \times 10^{-10}$ . Based upon the difference in oxygen  
6 permeability, Patentee asserts that the substitution of a polyfunctional  
7 siloxanyl ester cross-linking agent, the conventional EDMA would be  
8 expected to decrease oxygen permeability. However, it appears that the  
9 increased oxygen permeability of the Example 42 copolymer may result from  
10 the 10 gram increase in the amount of S<sub>3</sub> organosiloxane comonomer. As  
11 noted by Tanaka, “[t]he oxygen permeability of the copolymers of the  
12 present invention is in proportion to the content of the before-mentioned  
13 particular organosiloxane . . . .” Tanaka, 11:23-25. See also Tables 3, 4 and  
14 8 which demonstrate the significant increase in oxygen permeability in  
15 proportion to an increase in organosiloxane comonomer. While we can not  
16 draw any conclusion from a comparison of Examples 29 and 42, we note  
17 that Tanaka credits at least a portion of the oxygen permeability of the  
18 copolymer to the siloxane bonds in the multifunctional siloxanyl ester  
19 crosslinking agent. Tanaka, 8:35-39 (“Since these cross-linking agents . . .  
20 have siloxane bonds in their molecules, the oxygen permeability of the  
21 obtained cross-linked copolymers is high . . . .”). A person of ordinary skill,  
22 upon reading Tanaka, would neither be discouraged from following the path  
23 set out in the reference, nor be led in a direction divergent from the path that  
24 was taken by Patentee. *Gurley*, 27 F.3d at 553, 31 USPQ2d at 1131, *Syntex*,

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<sup>6</sup> The compound ethylene glycol dimethacrylate may also be called ethylenedimethacrylate.

1 407 F.3d at 1380, 74 USPQ2d at 1830. Tanaka does not teach away from  
2 using multifunctional siloxanyl ester crosslinking agents.

3         Gaylord also does not describe the specifically claimed method of  
4 making TRIS. At the time of Patentee's invention, TRIS was a known  
5 comonomer useful in making contact lens materials. The hypothetical  
6 person having ordinary skill in the contact lens material art would have been  
7 aware of the known techniques for forming the contact lens comonomers  
8 such as TRIS. Gaylord, for example, describes ways of making  
9 comonomers, including two techniques for making TRIS. Gaylord,  
10 Examples 1 and 22, 6:40-7:18 and 11:25-51. Quaal describes another.  
11 Based on the record before us, one having ordinary skill in the art would  
12 have expected that the source of the TRIS comonomer, i.e., the method of  
13 making TRIS, would have little or no effect on the copolymerization process  
14 and resulting contact lens copolymer. It would have been obvious,  
15 therefore, to use TRIS made by any known process, including the process  
16 taught by Quaal as the source for TRIS in the copolymerization process  
17 taught by Gaylord. The substitution of a known method of making TRIS for  
18 the known method expressly taught by Gaylord gives nothing more than the  
19 predictable result and would have been obvious. *KSR*, 127 S.Ct. at 1739.  
20 "The results of ordinary innovation are not the subject of exclusive rights  
21 under the patent laws." *KSR*, 127 S.Ct. at 1745.

22         Patentee argues that there are differences between the claimed process  
23 for making TRIS and the process specifically described by Quaal. For

1 example, Patentee notes that Quaal does not expressly describe making  
2 TRIS from MAS and TMCS alone.<sup>7</sup>

3 One having ordinary skill in the art would have understood the  
4 chemistry involved in Quaal's process and would have expected that TRIS  
5 could be made by hydrolysis of MAS and TMCS alone. Quaal teaches a  
6 general reaction for making tris-siloxy acrylic silanes, such as TRIS, having  
7 the general formula  $(\mathbf{R}_3\mathbf{SiO})_3\mathbf{Si-R}'\text{-OOCC(R'')}=\text{CH}_2$ . This process involves  
8 the cohydrolysis of two compounds, a compound having the formula  
9  $\mathbf{X}_3\mathbf{Si-R}'\text{-OOCC(R'')}=\text{CH}_2$  and an excess of a compound of the type  $\mathbf{R}_3\mathbf{SiX}$ .  
10 Thus, Quaal's basic process only requires cohydrolysis of two compounds.

11 Patentee also makes much of the fact that Quaal's Example 1, which  
12 is directed to making TRIS, does not teach making TRIS by cohydrolysis of  
13 MAS and TMCS alone.

14 Quaal's Example 1 describes the cohydrolysis of MAS and TMCS  
15 and a third compound,  $(\mathbf{CH}_3)_3\mathbf{SiOCH}_3$ . Example 1 in no way diminishes  
16 Quaal's general teaching of reacting two compounds and is totally consistent  
17 with that teaching. A reference must be evaluated for all that it teaches, and  
18 is not limited to its examples or preferred embodiments. *Merck & Co. v.*  
19 *Biocraft Labs., Inc.*, 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir.  
20 1989); *In re Fracalossi*, 681 F.2d 792, 794 n.1, 215 USPQ 569, 570 n.1  
21 (CCPA 1982); *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280  
22 (CCPA 1976). Additionally, Quaal's general reaction may be represented  
23 by the following equation:



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<sup>7</sup> As we stated above at p. 9 we have adopted Patentee's construction of the literal scope of Claim 1 as permitting only the cohydrolysis of MAS and TMCS.

1 One having ordinary skill in the art would have fully understood the  
2 chemistry of this reaction. In particular, that person would have understood  
3 that the tris siloxy component ( $(\mathbf{R}_3\mathbf{SiO})_3$ ) in the product comes from the silyl  
4 moiety ( $\mathbf{R}_3\mathbf{Si}$ ) provided by the  $\mathbf{R}_3\mathbf{SiX}$  reactant. In Quaal's Example 1, there  
5 are two  $\mathbf{R}_3\mathbf{SiX}$  reactants: (1)  $(\mathbf{CH}_3)_3\mathbf{SiCl}$  (TMCS) and (2)  $(\mathbf{CH}_3)_3\mathbf{SiOCH}_3$ .  
6 Both provide the same silyl moiety ( $(\mathbf{CH}_3)_3\mathbf{Si}$ ) and both meet the Quaal's  
7 definitions for  $\mathbf{R}_3\mathbf{SiX}$ . One having ordinary skill in the art would have  
8 predicted and expected from Quaal's general teaching and an understanding  
9 of the chemistry of the Quaal's cohydrolysis reaction that TMCS alone  
10 would provide the necessary silyl moiety. Making TRIS by the cohydrolysis  
11 of MAS and TMCS alone would have been obvious.

12 Patentee also notes that Quaal does not expressly describe forming  
13 TRIS by adding the reactants to 3-10 volumes of water. Quaal, however,  
14 provides an operative guideline for the amount of water to be used: "The  
15 amount of water employed is not particularly critical except that enough  
16 should be employed for the hydrolysis reaction to proceed at a satisfactory  
17 rate." Quaal, 1:50-53. Thus, it is within the skill of those working in the art  
18 to determine the appropriate amounts of water for use in making TRIS. The  
19 statement as to the amount of water does not distinguish Patentee's method  
20 of making TRIS from Quaal's method in an unexpected or unobvious way.

21 Patentee also notes that Quaal uses a water-solvent mixture in the  
22 hydrolysis reaction rather than water alone as required by Claim 1. Quaal,  
23 while preferring to use a solvent, characterizes the solvent as "not essential  
24 to the process." Quaal, 1:55. Thus, the making of TRIS without the use of  
25 a solvent is suggested, is within the ordinary skill in the art, and would have  
26 been obvious.

1 Patentee's specific method of making TRIS follows Quaal's teachings  
2 and recites process specifics which are within the level of skill in the art and  
3 provide only the expected results. The substitution of Quaal's known  
4 method for making TRIS for the method expressly described by Gaylord  
5 would have been obvious.

6 **Secondary considerations**

7 **Neefe Declaration**

8 Patentee relies on the Neefe declaration asserting secondary  
9 considerations of unexpected results, commercial success, long felt need and  
10 copying of the invention by others. Reply Brief in Response to Supplemental  
11 Examiner's Answer, p. 3.

12 The Neefe declaration has been carefully considered. However, it is  
13 insufficient to prove secondary considerations of non-obviousness.

14 Patentee argues that the contact lens materials which result from the  
15 claimed process have unexpectedly high oxygen permeability as compared  
16 to the materials described by Gaylord. Reply Brief in Response to  
17 Supplemental Examiner's Answer filed September 9, 2005, p. 3, p. 20.

18 Patentee asserts that the declaration establishes unexpected results in that the  
19 "Claim 1 method provided contact lens polymer materials that were as much  
20 as 30 times more oxygen permeable than were commercial products  
21 manufactured according to the teachings of Gaylord." Reply Brief in  
22 response to Supplemental Examiner's Answer filed September 9, 2005,  
23 p. 20. Specifically, Patentee relies on ¶ 9 of the Neefe declaration.

24 Paragraph 9 relies on an Exhibit 3, said to be attached to the declaration, to  
25 show a comparison between the Gaylord materials and those made with the  
26 process of the invention. However, no document identifiable as Exhibit 3 is

1 attached to the Declaration in the official PTO record and an Exhibit 3 was  
2 not located in a review of that record.<sup>8</sup> Based upon the record before us,  
3 Patentee failed to prove unexpected results.

4 In any event, taking the declaration statements in ¶ 9 at face value, the  
5 declaration does not establish that the materials were comparable and  
6 differed only in the cross-linking agent. To show unexpected results, a  
7 comparison of the invention with the prior art must be under identical  
8 conditions except for the novel features of the invention. *In re Brown*,  
9 459 F.2d 531, 173 USPQ 685 (CCPA 1972).

10 Patentee also relies on ¶¶ 8-10 of the Neefe declaration to show  
11 commercial success, long felt need and copying by others. Reply Brief in  
12 Response to Supplemental Examiner's Answer filed September 9, 2005,  
13 p. 3, p. 20.

14 Secondary considerations such as commercial success, long felt need,  
15 and copying by others, while relevant to the obviousness inquiry, must be  
16 proved with clear and convincing evidence. *Snow*, 471 F.2d at 1404,  
17 176 USPQ at 331; *Miegel*, 404 F.2d at 381, 159 USPQ at 717; *Heyna*,  
18 360 F.2d at 228, 149 USPQ at 697; *Lohr*, 317 F.2d at 388, 137 USPQ at  
19 550-551. Patentee has provided only conclusory statements. With respect to  
20 commercial success, Patentee has not provided evidence of actual sales,  
21 market share, growth in market share, replacing earlier units sold by others  
22 or of dollar amounts, and no evidence of a nexus between sales and the

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<sup>8</sup> There appears to be three documents attached to the declaration. The documents marked Exhibit 1 and Exhibit 2 are single page documents showing reproductions of chemical structure models. The third document is titled "Declaration of Sutton under 37 CFR § 1.132." The relevance of this document to the appeal is not readily apparent.

1 merits of the invention. *Kansas Jack, Inc. v. Kuhn et al.*, 219 USPQ 857,  
2 861 (Fed. Cir. 1983). Similarly, with respect to long-felt need, Patentee has  
3 not proved that there was recognition in the art of a problem that existed for  
4 a long period of time without solution. *Iron Grip Barbell Co. v. USA Sports,*  
5 *Inc.*, 392 F.3d 1317, 1325, 73 USPQ2d 1225, 1230 (Fed. Cir. 2004); *In re*  
6 *Mixon*, 470 F.2d 1374, 1377, 176 USPQ 296, 299 (CCPA 1973). Lastly,  
7 while copying of a claimed invention can be evidence of nonobviousness  
8 (*Panduit Corp. v. Dennison Manufacturing*, 227 USPQ at 349 (Fed.Cir.  
9 1985)), Patentee has provided only the bare statement “virtually the entire  
10 RGP industry uses my invention.” Neefe Declaration, filed January 19,  
11 2001, p. 3, ¶ 10. Assuming the truth of this statement, a mere use of the  
12 invention alone is not sufficient to prove that the invention was copied. *Iron*  
13 *Grip Barbell*, 392 F.3d 1317 at 1325, 73 USPQ2d at 1230 (“Not every  
14 competing product that arguably falls within the scope of a patent is  
15 evidence of copying.”).

16 Patentee’s declaration does not establish clear and convincing  
17 evidence of any secondary considerations of non-obviousness.<sup>9</sup> Indeed,  
18 Patentee’s declaration does not establish secondary considerations by even a  
19 preponderance of the evidence.

20 **ORDER**

21 The decision of the examiner is affirmed.  
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<sup>9</sup> We have not separately listed each of the plethora of arguments raised by Patentee. However, each has been carefully considered but not persuasive of patentability and finds response in the analysis above.

Appeal 2007-1366  
Application 90/005,090

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