

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* HARUO WATANABE, YASUHITO INAGAKI,  
and TSUTOMU NOGUCHI

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Appeal 2007-4332  
Application 09/794,004  
Technology Center 1700

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Decided: March 26, 2008

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Before PETER F. KRATZ, CATHERINE Q. TIMM, and  
JEFFREY T. SMITH, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 6-8 and 31-33. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

## I. BACKGROUND

The invention relates to an antimicrobial agent. The agent is a metal-salt copolymer containing acrylonitrile units. The copolymer further includes units of either styrene, conjugated diene, or both. 5-80 mole % of the copolymer units are derived from acrylonitrile. Claim 31 is illustrative of the subject matter on appeal:

31. An antimicrobial agent, comprising:

a metal-salt-containing copolymer,

wherein said metal-salt-contains copolymer containing units from acrylonitrile and units from styrene, conjugated diene, or, styrene and conjugated diene,

said copolymer comprising 5 to 80% by mole of said units from acrylonitrile,

said copolymer containing acid radicals forming salts with metals, and

wherein said metal-salt-containing copolymer further comprises an inorganic pigment.

The Examiner maintains two rejections:

1. Claims 6-8 and 31-33 are rejected under 35 U.S.C. § 103(a) over Stoy (US 3,734,897 issued May 22, 1973) in view of Dennington (US 4,139,515 issued Feb. 13, 1979); and
2. Claims 6-8 and 31-33 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-45 of copending Application No. 09/948,494.

## II. DISCUSSION

### *The Obviousness-type Double Patenting Rejection*

With respect to the obviousness-type double patenting rejection over Application 09/948,494. This rejection is moot in view of the abandonment of Application 09/948,494.

### *The Obviousness Rejection*

The Examiner further rejects claims 6-8 and 31-33 as obvious over Stoy in view of Dennington. Stoy is cited as teaching a metal-salt copolymer having acrylonitrile units and styrene units. The Examiner finds that, while Stoy does not expressly teach proportions for the acrylonitrile units, use of the claimed 5 to 80 mole % would have been obvious from the teachings of the reference.

Appellants contend that "as Stoy '897 fails to disclose, teach or suggest acrylonitrile present in the pretreated polymer at a proportion of 5 to 80 % by mole, and only discloses a "possibility," or an invitation to explore other variations, a *prima facie* case of obviousness has not been presented." (Br. 7.) According to Appellants, the suggestion in Stoy may make the approach "obvious to try" but it does not make the invention obvious (Br. 6).

The issue arising from the contentions of the Examiner and Appellants is: Have Appellants shown that the evidence fails to support the Examiner's obviousness rejection based on the asserted lack of teaching or suggestion to include acrylonitrile units at the proportion of 5 to 80 mole % in the copolymer of Stoy?<sup>1</sup>

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<sup>1</sup> Appellants present two groups of claims, i.e., Appellants group I (claims 6-8) and group II (claims 31-33), but the issue to be resolved is the same for both groups. No separate discussion is necessary.

A preponderance of the evidence of record supports the following Findings of Fact (FF):

1. Stoy teaches preparing metal-salt containing copolymers from copolymers or polymer mixtures containing both nitrile groups and strong acidic groups (Stoy, col. 1, ll. 16-30).
2. In the copolymers, particularly for special uses, the preferred monomers are acrylonitrile (for supplying the nitrile groups) and the sodium salt of either ethylene sulfonic acid or styrene sulfonic acid (for supplying the acidic groups) (Stoy, col. 2, ll. 31-34).
3. Stoy suggests use of the copolymers in a number of different applications including membranes, ion exchangers, light sensitive layers, catalysts and hydrophilic coatings (Stoy, col. 1, ll. 14-18).
4. Stoy further suggests use in “special coatings, particularly for ships and other articles immersed permanently in water. They are smooth and resisting to many undesired organisms.” (Stoy, col. 3, ll. 27-31).
5. Stoy indicates that the proportions of the nitrile groups and acidic groups may vary within the copolymer and discloses processing differences for different concentration levels. For instance, Stoy states that “[i]f the share of the acidic monomer prevails, it is possible to use water as common solvent” (Stoy, col. 2, ll. 42-43) whereas Stoy lists other solvents that “are very useful if the monomer, bearing nitrile groups, prevails” (Stoy, col. 2, ll. 58-65).
6. The effect of the concentration is also discussed in terms of its effect on copolymer properties. For instance, Stoy states that the swelling capacity of the copolymer decreases with decreasing amounts of strong acid groups (Col. 4, ll. 7-8).

7. Stoy also indicates that the proportions should be tailored for the specific end use. For instance, as discussed by Stoy, “[w]ith prevailing acidic groups the new polymers can be used as cation exchangers. With prevailing nitrile groups, they have properties of anion exchangers.” (Stoy, col. 3, ll. 45-47; *see also* col. 4, ll. 56-62). Moreover, the possibility of adjusting properties by varying the ratio of monomers is an advantage (Stoy, col. 4, ll. 36-39).
8. Example 1 of Stoy discloses forming a copolymer from 2 mols of acrylonitrile and 1 mol of sodium ethylenesulfonate. This translates to a copolymer containing 2/3 or 66.6 mole % nitrile groups and 1/3 or 33.3 mole % acid units.
9. Example 9 repeats the process of Example 6 except using polystyrene sulfonic acid instead of polyethylene sulfonic acid. The product had similar properties to the product of Example 6 and also to Example 5, an example using polyethylene sulfonic acid (Examples 5, 6, and 9).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007) (quoting 35 U.S.C. § 103(a)). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the

sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”).

The inquiry of obviousness does not lend itself to rigid rules, a flexible approach must be taken. *KSR*, 127 S. Ct. at 1739. “[T]he analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, [we must take into] account the inferences and creative steps that a person of ordinary skill in the art would employ. *KSR*, 127 S. Ct. at 1941. Moreover, care should be taken when considering whether something is “obvious to try.” *See KSR*, 127 S. Ct. at 1742 (“The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was “obvious to try.”) and *In re O’Farrell*, 853 F.2d 894, 902 (Fed. Cir. 1988) (“It is true that this court and its predecessors have repeatedly emphasized that “obvious to try” is not the standard under § 103. However, the meaning of this maxim is sometimes lost. Any invention that would in fact have been obvious under § 103 would also have been, in a sense, obvious to try.”). We must consider what the prior art would have suggested to one of ordinary skill in the art at the time the invention was made. *See Merck & Co., v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) and *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Applying the preceding legal principles to the Factual Findings in the record of this appeal, we determine that the Examiner has established a *prima facie* case of obviousness.

Stoy provides evidence that determining the workable or optimum concentration or proportion of nitrile units was within the skill of the ordinary artisan. This is shown by the fact that Stoy states that the

proportion of nitrile can vary within the copolymer (FF 5), Stoy provides guidelines for processing based on different levels of nitrile (FF 5), Stoy discusses the effects of different nitrile levels on properties (FF 6), and Stoy discusses tailoring the proportion for different end uses (FF 7).

Moreover, as pointed out by the Examiner, Stoy describes using the copolymer as a coating resistant to undesired organisms, i.e., an antimicrobial coating (FF 4; Ans. 3), the same function as sought by Appellants.

This is the kind of situation that requires Appellants to show secondary considerations such as unexpected results over the “critical range” to overcome the *prima facie* case. *See In re Huang*, 100 F.3d 135, 139 (Fed. Cir. 1996) (“This court and its predecessors have long held, however, that even though applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art, unless the claimed ranges ‘produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art’” quoting *Aller*, 220 F.2d 454, 456 (CCPA 1955)); *see also Aller*, 220 F.2d at 456 (“Such ranges are termed ‘critical’ ranges, and the applicant has the burden of providing such criticality.”).

We further note that Appellants' claimed range is broad, encompassing values of 5 to 80 mole %, and that Stoy's Example 1 describes a copolymer containing 66.6 mole % nitrile, albeit with 33.3 mole % ethylenesulfonate instead of styrenesulfonate (FF 8). These facts provide further evidence in support of the *prima facie* case of obviousness because whether the acid groups are formed from ethylene-based sulfonate or

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styrene-based sulfonate, the acid properties would be expected to be similar, this being supported by the fact that Example 9, made with polystyrene sulfonic acid, had similar properties to Examples 5 and 6, made with polyethylene sulfonic acid (FF 9).

Appellants have not presented any objective evidence of unexpected results for the claimed range, nor have they presented any other evidence of secondary considerations.

### III. CONCLUSION

We conclude that the Examiner established a prima facie case of obviousness which has not been sufficiently rebutted by Appellants.

### IV. DECISION

We affirm the decision of the Examiner.

### V. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

PL initials:  
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