

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

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NEIL R. WILSON

Appeal 2007-2774
Application 10/285,632¹
Technology Center 1700

Decided: September 18, 2007

Before TEDDY S. GRON, CAROL A. SPIEGEL, and MARK NAGUMO,
Administrative Patent Judges.

SPIEGEL, *Administrative Patent Judge.*

DECISION ON APPEAL

I. Introduction

Neil R. Wilson (hereinafter "Appellant") seeks our review under 35 U.S.C. § 134 (2002) of the Examiner's final rejection of claims 1-3, 5-8, 10-13, 15-16, 38-39, 43 and 45 (Br. at 2). Claims 18-23, 25-26, 28, 40-42

¹ Application filed 1 November 2002. The real party-in-interest is said to be Henkel Kommanditgesellschaft auf Aktien (Appeal Brief ("Br.") filed 6 December 2006, at 1).

and 44 have been cancelled without prejudice for purposes of this appeal (Br. at 2; Answer² at 3). We have jurisdiction under 35 U.S.C. § 6(b) (2002). We REVERSE.

The subject matter on appeal is directed to a method of treating a "dirty" water-based flush solution used to remove paint from coating application equipment such that a portion of the treated flush solution is recycled back to the application equipment. Claims 1 and 45 are illustrative and read as follows (emphasis added):

1. A process for removing solids from a water-based flush solution comprising:

providing dirty flush solution, wherein the dirty flush solution contains from 5% to 20% by volume paint;

directing the dirty flush solution to a treatment vessel;

adding one or more chemicals to the treatment vessel to form a treated flush solution, wherein the one or more chemicals include a flocculent [sic] or a coagulant to facilitate removal of paint compounds by forming aggregated paint compounds that have a particle size of at least 20 microns;

separating aggregated paint compounds from the treated flush solution to form a filtered flush solution; and

directing the filtered flush solution to spray application equipment.

² Examiner's Answer ("Answer") mailed 13 February 2007 and remailed 17 April 2007.

45. The process of claim 1 wherein *the filtered flush solution is 59% to 95% as effective in removing paint from the spray application equipment as fresh flush solution.*

The Examiner has rejected claims 1-3, 5-8, 10-13, 15-16, 38-39, 43 and 45 under 35 U.S.C. § 103(a). The Examiner relies upon the following prior art³ of record:

Mizuno	US 4,656,059	Apr. 7, 1987
Knipe	US 5,854,190	Dec. 29, 1998
Mahoney	US 6,627,086 B2	Sep. 30, 2003

Mizuno and Knipe qualify as prior art under 35 U.S.C. § 102(b); Mahoney qualifies as prior art under 35 U.S.C. § 102(e). Claims 1-3, 5-8, 10-13, 15-16, 38-39, 43 and 45 stand rejected under 35 U.S.C. § 103(a) as obvious over the combined teachings of Knipe, Mahoney and Mizuno.

Appellant argues that the combination of Knipe, Mahoney and Mizuno fails to teach or suggest "providing dirty flush solution, wherein the dirty flush solution contains from 5% to 20% by volume paint," as recited in all of the claims on appeal. Appellant contends that, according to the prior art, a typical dirty flush solution contains less than 1% by volume paint. Appellant relies on the following prior art, in addition to Mizuno, Knipe and Mahoney, (Br. at 20):

Forney	US 3,990,869	Nov. 9, 1976
Gabel	US 3,990,986	Nov. 9, 1976
Puchalski	US 4,440,647	Apr. 3, 1984
Leitz	US 4,629,572	Dec. 16, 1986
Arots	US 4,686,047	Aug. 11, 1987
Merrell	US 4,853,132	Aug. 1, 1989
Rey	US 5,240,509	Aug. 31, 1993

³ No references to *et al.* or *Jr.* are made in this opinion.

II. Findings of Fact (FF)

The following findings of fact are supported by a preponderance of the evidence of record.

1. Appellant's Specification

- [1] According to Appellant's Specification, automotive assembly paint shops use flush solutions to remove residual paint from paint application equipment in various cleaning cycles, e.g., paint line purge and nozzle or cap wash cycles (Specification at 1).
- [2] Appellant's Specification describes a process for removing paint particles from a "dirty" flush solution comprising "providing dirty flush solution; directing the dirty flush solution to a treatment vessel; adding one or more chemicals to the treatment vessel to form a treated flush solution; separating aggregated paint compounds from the treated flush solution to form a filtered flush solution; and directing the filtered flush solution to spray application equipment" (Specification at 2).
- [3] The chemicals used to treat the dirty flush solution are coagulants and/or flocculants that cause the paint particles to aggregate and are commonly used in the automotive industry for treating wastewater (Specification at 4-5).
- [4] Exemplary coagulants include di- or tri-valent metal salts and water-soluble electrolytes; exemplary flocculants include cationic and anionic polymers (Specification at 5).
- [5] The amount of coagulant/flocculant added to the treatment vessel depends upon the concentration of paint in the dirty flush solution,

- preferably 0.1 to 5% by volume of the total volume of dirty flush solution to be treated (Specification at 5-6).
- [6] The coagulated or flocculated paint particles will generally form aggregates larger than 20 microns, thereby allowing separation by a centrifugal separation unit, a filter press unit or a microfiltration unit (Specification at 7).
- [7] "By increasing the particle size of the suspended water-based paint particles, water and water-based solvents can be separated in about half the time or less compared to a process that relies upon ultrafiltration" (Specification at 7).
- [8] Optionally, a second separation unit can be used (Specification at 6).
- [9] For example, primary and secondary separation units can comprise a series of cartridge filters with the primary separation unit having relatively larger pore openings than the secondary separation unit (Specification at 8).
- [10] In one embodiment, the second separation unit may be an ultrafiltration unit because the primary separation unit is said to have already separated out the larger paint particles (Specification at 6).
- [11] Ultrafiltration units are said to have pore sizes ranging from 0.005 to 0.1 micron (Specification at 7).
- [12] "In many instances, the process can operate at recovery rates of water and solvent greater than 70% depending on the separation unit used. For example, microfiltration of the coagulated/flocculated paint particles using a 20 micron pore size filter can result in greater than 70% recovery efficiency." (Specification at 8.)

2. Knipe

- [13] Knipe generally relates to compositions, methods and apparatuses for purging coating equipment, e.g., paint lines, paint sprayers and paint equipment, using water-based flushing solutions (Knipe at col. 1, ll. 10-16; col. 3, ll. 1-3 and 39-41).
- [14] Knipe's apparatus includes a clean-up system for regenerating and recycling used flush (purge) solutions comprising removing paint particulates therefrom (Knipe at col. 3, ll. 11-18; col. 5, ll. 20-28).
- [15] Dirty flush solution from line 19 flows through filter bag 18 into neutralization tank 14 where the pH of the filtered flush solution is adjusted, if necessary (Knipe at col. 4, ll. 36-46; Fig. 1).
- [16] Additional paint separation occurs as paint settles to the bottom of neutralization tank 13 and the "settled" paint is discharged into a paint sludge drum 15 by opening a paint sludge dump valve 14 (Knipe at col. 5, ll. 48-52).
- [17] Regenerated flush solution flows from neutralization tank 13 through line 12 and a series of 25 micron filters 9, 10 into water line 8 which dilutes flush solution concentrate from tank 6 to provide a fresh supply of flush solution (Knipe at col. 5, ll. 59-65).
- [18] According to Knipe, filter bag 18 must be cleaned periodically and filters 9 and 10 must be replaced periodically (Knipe at col. 5, ll. 66-67).
- [19] Knipe is silent as to the paint content of the used flush solution being regenerated.

[20] Knipe does not describe adding a flocculant and/or coagulant to the the used flush solution in an amount sufficient to form aggregated paint particles of at least 20 microns in size.

3. Mahoney

[21] Mahoney describes treating aqueous solutions of paint in flush solutions, e.g., from paint spray guns and other painting equipment, with a polyarylamine polymer detackifier to convert the paint in the "dirty" flush solutions into non-sticky sludge for easier removal (Mahoney at abstract; col. 1, ll. 32-37; col. 3, ll. 34-39; col. 8, ll. 47-56).

[22] The polyarylamine is formed by polymerizing an aromatic amine, e.g., aniline, with an aldehyde, e.g., formaldehyde (Mahoney at col. 3, l. 62 through col. 4, l. 26).

[23] The polyarylamine, alone or in combination with other detackifiers, such as flocculants and coagulants, e.g., iron and aluminum salts, can be mixed with the paint containing waste water by any known means and the coagulated paint particles can be removed by any conventional means, e.g., filtration (Mahoney at col. 9, ll. 4-61).

[24] Example 15 of Mahoney is said to describe a test protocol using a simulated dirty flush solution of 1 ml of paint in 500 ml of process water, i.e., simulated dirty flush solution containing 0.2 % paint by volume (Mahoney at col. 12, ll. 37-50).

4. Mizuno

[25] Mizuno also describes a reagent useful to detackify paint in aqueous paint suspensions, i.e., a reagent containing 0.1 to 20% by weight of a

melamine-aldehyde acid colloid and, optionally, a flocculant (Mizuno at col. 3, ll. 34-46).

[26] Examples 1-8 of Mizuno describe a test protocol using a simulated dirty flush solution having 2,000 mg paint/liter water (Mizuno at col. 6, ll. 29-53).

5. Rejection over the Prior Art and Rebuttal

[27] The Examiner found that Knipe described a process meeting all the limitations of claim 1 but for (a) requiring addition of a flocculant and/or coagulant to the used flush solution in a dosage sufficient to form paint particle aggregates at least 20 microns in size, and (b) requiring the used flush solution to contain between 5 and 20 percent by volume of paint (Answer at 5, ¶ 2, and 7, ¶ 1).

[28] The Examiner found that Mahoney taught adding pH-adjusting chemicals, coagulants and/or flocculants to aggregate and remove paint particles from used flush solutions being purified and recycled (Answer at 6, ¶ 1).

[29] The Examiner found that forming aggregated paint particle sizes of at least 20 microns is an inherent property of the coagulants and/or flocculants used by Mahoney because both Mahoney and Appellant's specification disclose use of the same "conventional" coagulants and flocculants (Answer at 6, ¶ 1).

[30] The Examiner concluded that it would have been obvious to incorporate a step of adding coagulant and/or flocculant to the used flush solution in an amount sufficient to result in aggregated particles of at least 20 microns into the method of Knipe as taught by Mahoney

- "in order to reduce the load of particulates accumulating at the various filters employed in Mahoney" (Answer at 6, ¶ 2).
- [31] Appellant does not contest the Examiner's above findings (FFs 24-26) or conclusion (FF 27).
- [32] The Examiner further found that Mahoney taught that large quantities of excess paint may be captured by recirculating wash water in applications concerning automotive vehicles at column 1, lines 16-22 and 32-35 (Answer at 7, ¶ 1).
- [33] The Examiner still further found that Mizuno taught that the concentration of melamine-aldehyde acid colloid in the circulating flush water is roughly 1 to 5,000 ppm and that the weight ratio of colloid to paint ranges from 0.1% to 300% (Answer at 7, ¶ 2).
- [34] The Examiner "extrapolated" Mizuno's teachings (FF 33) to obtain a paint concentration of approximately 1% to 50% by volume and pointed to column 6, lines 29-32, of Mizuno in support of his "extrapolation" (Answer at 7, ¶ 2).
- [35] Column 6, lines 29-32, of Mizuno reads "A paint solution was prepared by dissolving an acrylic type resin paint in a solvent (composed of toluene, acetone, methyl acetate, and methanol in a volume ratio of 10:30:30:30)."
- [36] The Examiner concluded that one of ordinary skill in the art would have recognized that used flush solution "may contain large quantities (5-20% by volume) of paint, since Mahoney and Mizuno teach that it is well known to treat recirculating spray paint booth water with large quantities of paint by flocculants and coagulants to agglomerate and detackify" (Answer at 8, ¶ 1).

- [37] Appellant argues that Mahoney's teaching of applying "large quantities" of paint does not provide a sufficient factual basis to conclude that 5 to 20% of recirculating flush water is paint (Br. at 10, ¶ 2).
- [38] Appellant expressly directs our attention to the test protocol in Example 15 of Mahoney, which uses a simulated dirty flush solution of 0.2% paint by volume, as an indication of the typical amount of paint found in used flush solutions (Br. 7, ¶ 3, and 11-12, Table 1; FF 24).
- [39] Appellant also directs our attention to eight patents of record, including Mizuno, said to show that, in the prior art as a whole, a typical used flush solution contains less than 1% by volume of paint due to the very large amounts of flush solutions used (Br. at 11, ¶ 2).
- [40] According to Appellant, the paint concentrations (volume %, unless noted otherwise) in the test solutions used in these eight patents are as follows:

Patent	Title	Vol. % Paint
Forney	Process for Controlling Pollution and Contamination in Paint or Lacquer Spray Booths	0.25
Gabel	Composition for the Clarification and Detackification of Paint Spray Booth Wastes	0.1
Puchalski	Paint Spray Booth Detackificaton Composition and Method	0.5
Leitz	Paint Detackification Method	1.0 (wt. %)
Arots	Process for Detackification of Paint Spray Operation Wastes	0.25
Merrell	Paint Spray Booth Treatment	1.0
Rey	Method for Removing Solids from Systems Containing Water-Based Paints	0.2
Mizuno	Wet Spray Booth Treating Agent and Method for Treatment Therewith	0.2

- [41] The Examiner does not contest Appellant's determination of the concentration of paint in the simulated test solutions of any of Mahoney, Forney, Gabel, Puchalski, Leitz, Artos, Merrell, Rey or Mizuno (Answer at 11).
- [42] Rather, the Examiner deems that "teachings of the prior art as a whole" only require a consideration of the teachings of the applied prior art, i.e., Knipe, Mahoney and Mizuno, and it "does not entail consideration of all possible germane prior art, only the teachings of the particular prior art most pertinent to the instant claims being considered for patentability" (Answer at 11).
- [43] The Examiner is of the opinion that the low paint % volumes used in the Examples of Mahoney and Mizuno were "inherently chosen to facilitate accurate testing and characterization" of the detackifiers being tested in a laboratory setting and "do not state that the relative amounts of paint to solution depict actual operating conditions" (Answer at 11).
- [44] The Examiner reiterates his position that extrapolating "Mizuno at column 4, lines 31-35 and 48-60 [,] suggest between 1 and 50 weight %, and hence volume %, of paint relative to wash water may be present during actual spray painting operations" (Answer at 11).

III. Obviousness

A claimed invention is not patentable if its subject matter would have been obvious to a person of ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), 148 USPQ 459. Facts relevant to a determination of obviousness include (1) the scope

and content of the prior art, (2) any differences between the claimed invention and the prior art, (3) the level of ordinary skill in the art, and (4) relevant objective evidence of nonobviousness. *KSR*, 127 S.Ct. at 1734, 82 USPQ2d at 1389; *Graham*, 383 U.S. at 17-18. If the underlying factual findings are not supported by evidence of record, the legal conclusion cannot stand. Moreover, when evidence is submitted in rebuttal of a prima facie conclusion of obviousness, the Examiner must consider *all* the evidence anew, reassessing the patentability of the invention under the § 103 criteria. *In re Rinehart*, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). "The quantum of evidence required to establish unobviousness will depend upon the strength of showing of obviousness made by the prior art." *In re Skoll*, 523 F.2d 1392, 1398, 187 USPQ 481, 485 (CCPA 1975). The evidence favoring unpatentability must be properly weighed against all the countervailing evidence. *Id.*, 523 F.2d at 1397-98, 187 USPQ at 484-485.

Claim 1 recites a process of treating a "dirty" water-based flush solution *containing from 5% to 20% by volume paint* to form a filtered flush solution sufficiently free of paint so that *the filtered flush solution is directed to spray application equipment*. In other words, the process of claim 1 must clean paint particles from the "dirty" flush solution sufficiently to prevent the cleaned ("filtered") flush solution which is directed back to spray application equipment from clogging the spray application equipment with residual paint particles. Claim 45 expressly requires the cleaned/filtered flush solution to be 59% to 95% as effective in removing paint from the spray application equipment as fresh flush solution. Both Mahoney and Mizuno teach that aqueous solutions of paint in flush solutions are "sticky" (FFs 21 and 25). Therefore, the process of claim 1 must remove a sufficient

amount of paint from the "dirty" water-based flush solution being treated so that the filtered flush solution obtained after treatment and directed to the spray application equipment does not stick to the equipment and render it inoperable.

The Examiner finds, and Appellant does not contest, that Knipe describes the process of claim 1 but for describing a used/dirty flush solution to contain between 5 and 20 % by volume of paint (FFs 27-31). The Examiner finds that Mahoney taught that "large" quantities of excess paint may have to be cleaned up with flush solution (FF 32) and "extrapolated" the teachings of Mizuno to find that Mizuno taught treating used/dirty flush solutions containing 1% to 50% paint by volume (FFs 33-36 and 44). The Examiner then concluded that a skilled artisan would have recognized that any used flush solution may contain "large" quantities, e.g., 5-20% by volume, of paint based on the teachings of Mahoney and Mizuno (FF 36).

Appellant contends that the prior art does not teach or suggest that a flush solution containing 5% to 20% by volume of paint could be successfully treated as claimed (Br. at 10-13). Appellant expressly directs our attention to eight different patent disclosures of record, including Mahoney and Mizuno, previously submitted as rebuttal evidence that typical used/dirty flush solutions being regenerated and recycled contained no more than 1% paint by volume (FFs 38-40).

This appeal raises two issues. First, is the Examiner factually correct in asserting that Mizuno describes dirty flush solutions containing 1 to 50% paint by volume. Second, does the rebuttal evidence submitted by Appellant outweigh the evidence of unpatentability relied upon by the Examiner.

- [45] In regard to the first issue, according to Mizuno, the concentration of melamine-aldehyde acid colloidal solution in the flush solution is in the range of 1 to 5,000 ppm and the weight of the melamine-aldehyde acid colloidal solution is 0.1 to 300% of the weight of the surplus paint (Mizuno at col. 4, ll. 48-60).
- [46] Three hundred percent of 5,000 ppm is 15,000 ppm which equates to 1.5 % by weight.
- [47] At column 6, line 38, Mizuno describes a simulated used flush solution having a paint concentration of 2,000 mg/liter of water.
- [48] Water has a density of approximately 1 gm/ml at 20⁰ C (see e.g., Hackh's CHEMICAL DICTIONARY, fourth ed. at 720).
- [49] A solution of 2,000 mg paint/1,000 gm water equates to 0.2% paint by weight.

Therefore, the Examiner's finding that Mizuno describes a paint concentration in used flush solution of 1 to 50% by weight appears to be incorrect (FF 46). If, as it appears, the Examiner's underlying factual finding, i.e., that Mizuno describes used flush solutions containing 1 to 50% by weight paint, is incorrect, the Examiner's ultimate legal conclusion of obviousness based thereon cannot stand.

In regard to the second issue, the Examiner has erred in failing to consider all of the rebuttal evidence submitted by Appellant. Appellant relied on the disclosure of eight patents, including Mahoney and Mizuno, to establish that a dirty flush solution used to clean paint application equipment typically contains less than 1% by volume of paint (FF 39). In essence, the Examiner found that the pertinent prior art as a whole must be limited to the prior art applied by the Examiner because that is "the particular prior art

most pertinent to the instant claims" (FF 42). According to the Examiner, his examination "does not entail consideration of all possible germane prior art" (FF 42). However, it is well settled that when evidence is submitted in rebuttal of a prima facie case of obviousness, the Examiner must consider anew all the evidence, including the rebuttal evidence, pertinent to the question of obviousness under the § 103 criteria. *In re Rinehart*, 531 F.2d at 1052, 189 USPQ at 147.

Furthermore, the Examiner has not provided a factual basis for his implicit conclusion that the low % paint by volume disclosed in the Examples of Mahoney and Mizuno are not meant to simulate actual operating conditions (FF 43). One of ordinary skill in the art would reasonably have been expected the artisan to use laboratory testing protocols that simulate expected actual operating conditions so that an informed decision as to the usefulness of the proposed method can be evaluated. Moreover, the rebuttal evidence submitted by Appellant not only spans approximately twenty years of routine practice in the prior art, but it is consistent over that time span in its description of the concentration of paint found in typical used flush solutions being treated.

Finally, the Examiner has not explained why one of ordinary skill in the art would have reasonably expected that a filtered flush solution obtained by treating a dirty/used flush solution containing 5 to 20 times as much surplus paint as typically present in a dirty/used flush solution could be recycled to the spray application equipment, as recited in claim 1, without effectively clogging up the equipment.

Based on the foregoing, we reverse the Examiner's rejection of claims 1-3, 5-8, 10-13, 15-16, 38-39, 43 and 45. *In re Fritch*, 972 F.2d 1260, 1266,

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23 USPQ2d 1780, 1784 (Fed. Cir. 1992) ("[D]ependent claims are nonobvious if the independent claims from which they depend are nonobvious ...").

CONCLUSION

In summary, the decision of the Examiner to reject claims 1-3, 5-8, 10-13, 15-16, 38-39, 43 and 45 under 35 U.S.C. § 103(a) as obvious over Knipe in view of Mahoney and Mizuno is reversed.

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

REVERSED

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