UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

REACTIVE SURFACES LTD., LLP,

Petitioner,

v.

TOYOTA MOTOR CORPORATION,

Patent Owner.

Case IPR2018-01194

Patent No. 9,193,873 B2

PATENT OWNER'S SUR-REPLY IN SUPPORT OF ITS PRELIMINARY RESPONSE

I. To Avoid § 325(d), Petitioner Must Show That, Unlike Russell, Selvig Provides a Motivation and a Reasonable Expectation of Success for Dispersing Amylase in "Non-Aqueous Organic Solvent-Borne" Polymers.

Challenged claims 1-5 describe protein-polymer materials in which one or more amylases are "dispersed in a two[-]component ***non-aqueous organic solvent-borne*** polymer resin." Patent Owner argued in its Preliminary Response that Ground 1A (McDaniel in view of Selvig) is indistinguishable from the prior art rejected during prosecution (Russell) in one crucial respect, specifically in its failure to establish a motivation and a reasonable expectation of success for dispersing amylase in "non-aqueous organic solvent-borne" polymers. Petitioner now suggests that Ground 1A is "materially distinguishable" from Russell simply because Russell used amylase in "water-borne" systems, while Selvig[1] uses amylase in materials that contain no aqueous solvent. (Reply at 3-5.) However, what matters is not whether Selvig uses an aqueous solvent (like Russell) or no aqueous solvent, but whether Selvig cures the deficiency of Russell and provides a motivation and a reasonable expectation of success for dispersing amylase in *organic solvent-borne* polymers, as claimed. As discussed below, it does not.

[1] Petitioner concedes that McDaniel does not disclose amylase. (Pet. at 37.) Petitioner relies on McDaniel for the other limitations of claims 1-5. McDaniel's failure to teach or suggest those limitations is an independent reason for denying Ground 1A, separate and apart from the § 325(d) issue. (*See* PO Resp. at 16-25.)

During prosecution, the applicants successfully argued to a panel of reviewers that the obviousness rejection over Russell should be withdrawn because Russell lacked any teaching or suggestion for incorporating amylase into an *organic solvent-borne* polymer. (Ex. 1012 at 1, 3-5.) In Russell's particular case, the proteins were incorporated in water-borne rather than organic solvent-borne materials. (*Ibid.*) While Selvig's materials are not water-borne (*see* Reply at 4), Petitioner has still not shown that Selvig teaches *organic solvent-borne* formulations, as discussed below. Nor has Petitioner explained why a reference teaching the use of amylase in a solvent-free system (i.e., a system with *no* aqueous *or* organic solvent) is any stronger than one teaching the use of amylase in a water-borne system (i.e., a system with an aqueous, but *no organic*, solvent), where the relevant issue is the existence of a motivation and a reasonable expectation of success for dispersing amylase in *organic solvent-borne* polymers. Therefore, the fact that Selvig's materials are not water-borne cannot help Selvig overcome the key deficiency identified in Russell during prosecution, namely the absence of any teaching directed to the use of amylase in organic solvent-borne polymers.

II. Petitioner Has Not Shown That Selvig Teaches the Use of Amylase in "Non-Aqueous Organic Solvent-Borne" Polymers.

Petitioner also suggests that Selvig materially differs from Russell because, unlike Russell, it teaches the use of amylase in organic solvent-borne materials. (Reply at 1-3.) However, the record fails to support this suggestion.

In the portions of Selvig relied upon by Petitioner, amylase is mixed with two different resin formulations: "Bondo" and "Devcon's 5 Minute Epoxy." (*See* PO Resp. at 10-11.) The Safety Data Sheet for Bondo states that this material consists of a polyester polymer, a styrene monomer, and silica. (Ex. 2003 at 3.) Citing McDaniel, Petitioner suggests that a styrene monomer is an organic solvent. (Reply at 2.) Petitioner misstates McDaniel's teaching because at most, McDaniel teaches only that an aromatic hydrocarbon like styrene *can* function as a solvent. However, it also explicitly recognizes that the ability of a liquid component to act as a solvent depends on several factors, including "the intermolecular interactions between the solvent molecules, between the potential solute molecules, between the solvent and the potential solute, as well as the molecular size of the potential solute." (Ex. 1004, ¶ 565; *see also id.*, ¶ 561.) McDaniel specifically identifies hydrocarbons as liquid components that may or may not function as a solvent depending on these factors. (*Id.*, ¶ 567.) Indeed, McDaniel notes that because there are "exceptions to the ability of certain liquid components and potential solute coating components to form solutions," there is a need to "empirically determin[e] the ability of a solute to dissolve in a solvent." (*Ibid.*)

Petitioner has not offered even a threshold amount of evidence, much less "empirical[]" proof, showing that the styrene monomer in Bondo functions as a solvent. Notably, Petitioner identifies no disclosure in McDaniel that suggests that

styrene monomers are used as solvents in formulations that (like Bondo) include a polyester polymer as the binder. Thus, Petitioner's suggestion that Bondo comprises a non-aqueous *organic solvent-borne* polymer is pure speculation.

Regarding Devcon's 5 Minute Epoxy, the Technical Data Sheet ("TDS") explicitly states that it contains "no solvents." (Ex. 2002 at 1.) Petitioner suggests that because the components are said to have "a 'mixed viscosity'(*i.e.*, are liquid)" before curing, the formulation *could* include a "solvent." (*See* Reply at 2-3.) However, Petitioner does not actually argue that 5 Minute Epoxy *must* include a solvent as opposed to some other liquid component. In any event, the issue is not whether this formulation includes a solvent or another liquid component, but whether it includes specifically a *non-aqueous organic* solvent. The TDS is clear that 5 Minute Epoxy contains "no solvents." Crucially, there is no dispute that this statement necessarily excludes the use of organic solvents, even if it arguably could be read to not exclude some other type of liquid component.

In sum, the teachings of Selvig relied upon by Petitioner provide no motivation or a reasonable expectation of success for dispersing amylase in non-aqueous organic solvent-borne polymers.

III. The Board Should Reject Ground 1A Under § 325(d).

The *Becton Dickinson* factors strongly favor rejecting Ground 1A. *See Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at

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