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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/615,136	12/22/2006	Carolyn Patricia Moorlag	20060815USNP/106681.17101	1431
75313	7590	02/04/2013	EXAMINER	
XEROX CORPORATION C/O FOX ROTHSCHILD I.L.P. Princeton Pike Corporate Center 997 Lenox Drive, Building 3 Princeton, NJ 08648-2311			WALTERS JR, ROBERT S	
			ART UNIT	PAPER NUMBER
			1717	
			NOTIFICATION DATE	DELIVERY MODE
			02/04/2013	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* CAROLYN PATRICIA MOORLAG,  
NAN-XING HU, MICHAEL STEVEN HAWKINS,  
GUIQIN SONG, and NICOLETA DOINITA MIHAI

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Appeal 2011-012374  
Application 11/615,136  
Technology Center 1700

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Before BRADLEY R. GARRIS, GRACE KARAFFA OBERMANN, and  
DONNA M. PRAISS, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134, Appellants appeal from the Examiner's rejection under 35 U.S.C. § 103(a) of claims 9, 12, 14-16, 18, and 24-29 as unpatentable over Fuller et al. (US 5,501,881, patented Mar. 26, 1996) in view of Tanaka (JP 2005-144751, pub. June 9, 2005; as translated), Niu et al. (US 6,746,627 B2, patented June 8, 2004), and Thostenson et al. ("Aligned Multi-Walled Carbon Nanotube-Reinforced Composites: Processing and Mechanical Characterization", *J. Phys. D: Appl. Phys.* 35, L77-L80 (2002)). We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

Appellants claim a method of coating a fuser member which comprises:

mixing carbon nanotubes and a fluoropolymer to yield a composite;  
using a screw extruder so that the carbon nanotubes are substantially uniformly dispersed in the composite;  
dispersing the composite into a solvent to form a suspension;  
coating the suspension onto a fusing member; and  
curing the coating on the fusing member (independent claims 9 and 24).

Representative claim 24 reads as follows:

24. A method of coating a fuser member, comprising:

preparing a mixture by receiving a batch of a material comprising carbon nanotubes;

adding a fluoropolymer comprising vinylidene fluoride to the material to yield a composite that comprises about 0.5% to about 10% by weight carbon nanotubes;

using a screw extruder to apply a mechanical shear force to the composite so that the carbon nanotubes are substantially non-agglomerated and substantially uniformly dispersed in the composite;

dispersing the composite into an effective solvent to form a suspension;

coating the suspension onto a fusing member;  
evaporating the solvent; and  
curing the coating on the fusing member.

Appellants do not present separate arguments directed to the rejected claims individually (App. Br. 11-14). Therefore, the appealed claims will stand or fall with representative independent claim 24.

We will sustain the above rejection for the reasons expressed in the Answer and below.

With respect to representative claim 24, the Examiner concedes that the fluoropolymer composite of Fuller's fuser-coating method does not include the claimed (1) carbon nanotubes (2) which have been uniformly dispersed therein with a screw extruder (Ans. para. bridging 3-4). Nevertheless, the Examiner concludes that it would have been *prima facie* obvious to provide Fuller's fluoropolymer composite with carbon nanotubes in view of Tanaka's use of such a combination for coating a fuser member and to utilize a screw extruder for uniformly dispersing the carbon nanotubes in the composite in accordance with the teachings of Thostenson (*id.* at para. bridging 4-5).

Appellants argue that the combination of applied references "does not teach or suggest the limitation of dispersive mixing of carbon nanotubes and fluoropolymers by extrusion to form a composite and dispersing this composite into a solvent" (App. Br. 11). In particular, Appellants argue that it would not have been obvious "to form a composite of nanotubes and

polymer and then dissolve this composite in a solvent based on the combination of *Fuller* and *Thostenson* because *Fuller* simply teaches a rubber slab [i.e., composite] containing fluoropolymer and fillers and dissolving the slab in a solvent and the extruded composite of *Thostenson* already contains solvent" (*id.* at para. bridging 12-13).

This argument is unpersuasive for the reasons fully explained by the Examiner (Ans. para. bridging 5-6). We agree with the Examiner that it would have been *prima facie* obvious to use a screw extruder as taught by *Thostenson* for uniformly dispersing carbon nanotubes in the fluoropolymer composite (i.e., the carbon nanotubes and fluoropolymer composite resulting from the uncontested combination of *Fuller* with *Tanaka*) and then to add solvent to the composite in accordance with the teachings of *Fuller* (*id.*). In this latter regard, we reiterate the Examiner's correct observation that the extruded composite of *Thostenson* does not contain solvent as Appellants erroneously believe (*id.*). Moreover, we emphasize that an artisan would have followed *Fuller*'s teaching of adding solvent, namely methanol, to the fluoropolymer composite (*see* Example I) in order to obtain the benefits of such methanol addition such as extended pot life (*id.* at col. 6, ll. 63-66).

Appellants also present a nonobviousness position based on the Specification disclosure that their method results in increased stability, which Appellants characterize as unpredictable (App. Br. 13), surprising (1<sup>st</sup> Reply Br. (filed 3/17/2011) 8), and unexpected (2<sup>nd</sup> Reply Br. (filed 7/26/2011) 8).

Again, Appellants' nonobviousness position lacks convincing merit. We agree with the Examiner that it would have been *prima facie* obvious to

combine the applied references in the manner proposed above and in the Answer and that the method resulting from this combination would yield the increased-stability results disclosed in Appellants' Specification (Ans. para. bridging 6-7). As previously indicated, Fuller teaches that methanol addition results in extended pot life. The record advanced by Appellants in this appeal reveals no distinction between the extended pot life taught by Fuller and the increased stability disclosed in their Specification.

Finally, Appellants contend that Fuller teaches dissolution of a composite into a solvent whereas claim 24 requires suspension of the composite into a solvent (1st Reply Br. 6-8; *see also* 2nd Reply Br. 7-8).

We fully share the Examiner's determination that this argument is not persuasive for the reasons expressed in the Supplemental Examiner's Answer (Sup. Ans. 5). In accordance with the Examiner's reasoning, Fuller's disclosure of allowing the rubber slab (i.e., the fluoropolymer composite) to dissolve in methyl isobutyl ketone (*see* Example II) results in dissolved or solubilized polymer and dispersed non-soluble composite components such as copper oxide. This aspect of Fuller's disclosure similarly corresponds to Appellants' disclosure of adding solvent such as methyl isobutyl ketone in order to create a suspension which includes solubilized polymer and dispersed non-soluble carbon nanotubes (Spec. para. [0041]). These circumstances lead us to agree with the Examiner that the record presented by Appellants reveals no distinction between their claimed suspension and Fuller's polymer solution (Example I at col. 6, l. 23) and ultimate dispersion (*id.* at ll. 52-53) as modified by the applied references.

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For the reasons expressed above and in the Answer, we sustain the Examiner's § 103 rejection of the appealed claims.

The decision of the Examiner is affirmed.

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

AFFIRMED

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