

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* DON DIMARZIO,  
CHARLES WEIZENECKER,  
STEVE CHU AND  
DOME ANTON

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Appeal 2007-0906  
Application 10/445,238  
Technology Center 1700

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Decided: September 14, 2007

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Before EDWARD C. KIMLIN, CHUNG K. PAK, and PETER F. KRATZ,  
*Administrative Patent Judges.*

KRATZ, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on an appeal from the Examiner's final rejection of claims 1-13, the only claims that remain pending in this application. We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

Appellants acknowledge that composites are used in a variety of applications and industries, such as in the aerospace or shipping industries for fashioning composite structural elements used for the exterior of aircrafts and ships (Specification 1). Such composite structures are subject to degradation due to their environmental exposure (*id.*). Coatings are applied to the composite components to mitigate exposure and resulting damage thereto (*id.*). Appellants' claimed invention is directed to an alleged improvement in a method of coating a composite structure with a liquid crystal polymer (LCP), wherein a layer of the LCP is applied to a tool, a layer of a composite material applied to the LCP layer, the layers cured, and the layers removed from the tool. In such a method, Appellants employ a multi-axially oriented LCP having a specified softening temperature that is not substantially greater than the temperature at which the layers are cured (Specification 3). According to Appellants, use of such an LCP may allow for better conformation of the LCP to the shape of the composite surface while curing at a temperature at which heat-induced damage to the coated composite is avoided (Specification 6). Appealed claims 1 and 4 are illustrative and reproduced below:

1. A method for thermoplastic coating a composite structure, comprising: applying a release agent on a working surface of a tool;

applying a layer of crystalline multi-axially oriented liquid crystal polymer having a softening temperature of about 110°C to 120°C onto the working surface;

applying a layer of composite material onto the crystalline multi-axially oriented liquid crystal polymer layer;

curing the crystalline multi-axially oriented liquid crystal polymer layer and the layer of composite material at a temperature of about 177°C; and

removing the crystalline multi-axially oriented thermoplastic layer and the layer of composite material from the tool.

4. A method for thermoplastic coating a composite structure, comprising:

applying a crystalline multi-axially oriented thermoplastic layer onto a working surface of a tool, the crystalline multi-axially oriented thermoplastic layer having a softening temperature;

applying a layer of composite material onto the crystalline multi-axially oriented thermoplastic layer;

curing the crystalline multi-axially oriented thermoplastic layer and the layer of composite material at a curing temperature; and

wherein the softening temperature is not substantially greater than the curing temperature.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

Harvey	US 4,966,807	Oct. 30, 1990
Clarke	US 6,174,405 B1	Jan. 16, 2001

Claims 1-13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Clarke in view of Harvey. Claims 1-13 stand rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-6 of Clarke taken in view of Harvey. We affirm both rejections. Our reasoning follows.

§ 103(a) Rejection

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). *See DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006) (“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”). Also, *see KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007) (analysis need not seek out precise teachings directed to specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ).

Appellants present separate arguments for rejected independent claims 1 and 4, as well as dependent claim 6. The other rejected dependent claims are not separately argued. Thus, we select claim 1 as the representative claim for rejected claims 1-3 and we select claim 4 as the representative claim for claims 4, 5, and 7-13.

The Examiner has determined that Clarke discloses a method for making a laminate film composite by the thermoplastic coating of a composite. The method includes, *inter alia*, the steps of: (1) applying a LCP thermoplastic layer onto a tool working surface; (2) applying a layer of

composite material onto the LCP layer; (3) curing the LCP and composite layers; and (4) removing the layers from the tool in a manner substantially corresponding to the claimed method (Answer 3; Clarke, col. 2, ll. 12-62, col. 3, l. 54 – col. 5, l. 24, Fig. 1). While Clarke discloses that a variety of available LCP materials can be used as a coating, including several VECTRA products available from Hoechst Celanese, Clarke does not explicitly describe the coating as being a multi-axially oriented LCP having a softening temperature within the temperature range recited in representative claim 1<sup>1</sup> and/or with a softening temperature as related to the curing temperature as specified in representative claim 4 (Clarke, col. 3, l. 54 - col. 4, l. 13).

Regarding the required LCP coating material as specified in representative claims 1 and 4, the Examiner additionally relies on Harvey to evidence that multi-axially oriented LCP coating materials are known to produce films having advantageous properties that are useful in making laminate film composites (Answer 4; Harvey, Abstract, col. 2, ll. 12-46, col. 3, ll. 20-25, and col. 6, ll. 8-68). As indicated by the Examiner (Answer 8 and 9), Appellants acknowledge Vectran<sup>TM</sup> is a known and available LCP that is bi-axially oriented and has a softening temperature of about 110 to 120 degrees Centigrade (Specification 6).<sup>2</sup> Furthermore, the Examiner has determined that Vectran<sup>TM</sup> is similar to an LCP material disclosed by Clarke and Harvey (Answer 8 and 9).

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<sup>1</sup> The claim 1 term “about 177°C” defines a temperature range, albeit the boundaries thereof may not be precisely defined.

<sup>2</sup> It is axiomatic that admitted prior art, including prior art found in an applicant’s Specification, may be used in determining the patentability of a

Based on these factual determinations, the Examiner has taken the position that it would have been obvious to one of ordinary skill in the art at the time of the invention to employ a conventional multi-axial oriented LCP, such as disclosed or suggested by Harvey or the Vectran<sup>TM</sup> as acknowledged by Appellants to be commercially available, as the LCP material used in the process of Clarke for yielding a composite laminate having improved strength characteristic (Answer 4 and 7-11). Moreover, in so doing, the Examiner has essentially determined that one of ordinary skill in the art would have been led to employ a workable curing temperature for the curing step of Clarke, via the use of routine skill and/or experimentation, that would have corresponded with the curing temperature required by claim 1 or by claim 4 (Answer 7-11).<sup>3</sup> We agree.

In light of our determinations set forth above and for reasons stated in the Answer, we are not persuaded by Appellants' arguments as to a lack of a teaching, suggestion or motivation for one of ordinary skill in the art to arrive at the claimed process from the applied prior art. Concerning Appellants' focus on an alleged lack of the claimed curing temperature being

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claimed invention, and that consideration of the prior art cited by the Examiner may include consideration of the admitted prior art found in the Specification. *In re Nomiya*, 509 F.2d 566, 570-571, 184 USPQ 607, 611-612 (CCPA 1975); *In re Davis*, 305 F.2d 501, 503, 134 USPQ 256, 258 (CCPA 1962).

<sup>3</sup> We do not agree that Clarke discloses a curing temperature at column 5, lines 5-10 and/or at column 5, lines 50-53 thereof to the extent the Examiner so argued (Answer 3 and 7). However, we deem this seemingly asserted matter to represent harmless error in that the Examiner correctly determined that selecting a workable curing temperature would have been within the skill level of an ordinarily skilled artisan upon routine experimentation.

described or suggested by Clarke (Reply Br. 4-6; Br. 6-7), we note that the disclosure of Clarke is directed to one of ordinary skill in the art who would be reasonably expected to have a sufficient level of skill to determine the workable and/or optimum operating temperature for the curing step disclosed by Clarke. In this regard, the law of obviousness is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable value specified in the claims. These cases have consistently held that the Appellants must show that the particular range or value is critical or would not have been ascertainable by exercising ordinary skill, generally by showing that the claimed parameter value achieves unexpected results relative to the prior art. *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). Here, Appellants have not persuasively argued or demonstrated that the recited temperature range (claim 1 or claim 4) is critical for achieving any unexpected result relative to the prior art or would otherwise have been outside the routine skill level of an ordinarily skilled artisan using routine experimentation.

Concerning this last noted matter, we are cognizant that Appellants have asserted that the Specification supports a certain level of criticality for the claimed curing temperature ranges because the claimed “curing temperature may have the desirable result of causing the thermoplastic layer to better conform to the shape of a composite surface, and may result in a coating with a more uniform thickness” (Reply Br. 8; Specification 5 and 6). We are not persuaded by the asserted and disclosed possibility of a shape conforming advantage by heating the thermoplastic LCP layer to a curing

temperature above a softening temperature thereof. Indeed, the asserted advantages are only described as being possible with the claimed curing temperature. Furthermore, no comparative tests have been furnished in the Specification to establish the criticality of the claimed curing temperature range of either representative claim 1 or claim 4. Lastly, the asserted possible advantages appear to be reasonably predictable potential advantages in that heating a polymer layer above the softening temperature thereof during curing would be reasonably expected to allow for some additional conformation of the softened polymer layer with the composite layer associated therewith which would concomitantly allow for adjusting the thickness of the LCP layer.

Concerning dependent claim 6, Appellants further argue that the additional step of abrading a facing composite surface before the composite is applied to the LCP layer on the tool is not taught or suggested by Clarke (Br. 7). Moreover, Appellants maintain that the Examiner erred in asserting the equivalence of abrading the composite with applying an adhesive as taught by Clarke because the Examiner makes the allegedly asserted equivalence rationale based on an alleged equivalence teaching from Appellants' Specification, not the prior art (Reply Br. 6; Answer 9-10, Specification 7, ll. 11-17; and Clarke, col. 5, ll. 18-24).

We agree with Appellants that the Examiner erred in referring to their Specification as if Appellants' asserted teaching therein were a prior art teaching of equivalence between abrading the composite with applying an adhesive for increasing bonding. However, we do not find that asserted Specification reference by the Examiner to be adequate to establish

reversible error in the Examiner's obviousness rejection of claim 6. This is because the Examiner has made a factual finding (Official Notice) that abrading is a conventional (well-known prior art) technique for increasing adhesion of one surface to another (Answer 4), which has not been denied by Appellants in their Reply Brief. Furthermore, aside from the Examiner's erroneous reference to Appellants' Specification for an alleged teaching regarding equivalence between abrading and applying an adhesive, the Examiner furnishes another rationale for the proposed modification of Clarke. This additional rationale is based on the Examiner's factual finding that abrading is conventional coupled with Clarke's teaching of optionally using adhesives to increase bonding. In this regard, the Examiner maintains that it would have been obvious to include the conventional abrading step in Clarke to obtain an expected increase in adhesion (Specification 3 and 4). With regard to this latter asserted basis for the modification of Clarke's process, Appellants do not present any persuasive arguments that are on point. Moreover, it appears to be reasonable that one of ordinary skill in the art employing an adhesive for increased bonding, as Clarke teaches, would have been reasonably led to use such a noticed conventional abrading step therewith to further increase the adhesion based on the increased surface area associated with a bonding surface subjected to abrasion.

On this record, we affirm the Examiner's obviousness rejection of claims 1-13.

### Obviousness-Type Double Patenting Rejection

Concerning the obviousness-type double patenting new ground of rejection over the claims of Clarke in view of Harvey presented in the Answer, Appellants argue independent claims 1 and 4 separately (Reply Br. 9-12). Dependent claim 6 is the only dependent claim argued separately (Reply Br. 12-14). Thus, we select claim 1 as the representative claim for rejected claims 1-3 and we select claim 4 as the representative claim for claims 4, 5, and 7-13. We affirm.

In an obviousness-type double patenting rejection, the analysis employed parallels the analysis of a § 103(a) obviousness determination. *See In re Longi*, 759 F.2d 887, 892-93, 225 USPQ 645, 648 (Fed. Cir. 1985).

Appellants contend, however, that the Examiner bases the rejection on the disclosure of Clarke rather than the claims of Clarke as a common asserted deficiency in the obviousness-type double patenting rejection of representative claims 1 and 4, and separately argued claim 6 (Reply Br. 9-14).

We agree with Appellants that the focus in determining the propriety of the Examiner's obviousness-type double patenting rejection must be on the obviousness of the here claimed subject matter over the claims in Clarke in light of the other relied upon prior art, including the prior art admissions of record. Thus, the Examiner has erred to the extent that the Examiner has referenced the non-claimed disclosure of Clarke in supporting the rejection. However, we do not find this argument presents a reversible error in the Examiner's obviousness-type double patenting rejection because the

Examiner clearly referenced claims 1-6 of Clarke in stating the rejection (Answer 2, 5).<sup>4</sup>

In this regard and as readily ascertainable by a reading of claim 1 of Clarke, it is unmistakable that this claim clearly recites a method corresponding to the method of separately argued representative claims 1 and 4. Claim 1 recites a method for coating a composite structure surface with a thermoplastic LCP coating including the steps of: (c) applying a LCP thermoplastic layer onto a tool [surface]; (e) applying a composite material onto the LCP layer; (f) curing the structure [LCP and composite layers]; and (g) removing the structure [layers] from the tool.<sup>5</sup> Similarly, claim 6, steps (c), (d), (f), and (g) of Clarke correspondingly recites substantially similar method steps in a method for applying a coating to a composite.

Appellants' representative claims 1 and 4 differ from the claims 1 and 6 primarily in requiring that the LCP is multi-axially oriented and in the specified curing temperature ranges required by claims 1 and 4, respectively.

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<sup>4</sup> Notwithstanding our disposition of the obviousness-type double patenting rejection presented for the first time in the Answer, we are somewhat disheartened by the presentation of this rejection not only for the numerous uncalled for references to the Patent Specification of Clarke rather than the claims of Clarke but also because of the lack of any clear necessity in introducing such an additional rejection over the claims of Clarke, when Clarke itself was available in its' entirety as a § 102(b) reference as employed in the § 103(a) rejection presented. In other words, the obviousness-type double patenting rejection would have had no chance of being affirmed if the 103(a) rejection were not affirmable. Under such circumstances, there is no point in presenting the obviousness-type double patenting rejection as another basis of rejection.

<sup>5</sup> We note that separately argued appealed claims 1, 4, and 6 employ open "comprising" transitional language in reciting the method steps leaving the appealed claims open to the use of other materials and method steps.

However, for reasons substantially similar to those discussed above with regard to the Examiner's § 103(a) rejection over Clarke in view of Harvey, we determine that these claim differences would have been obvious to one of ordinary skill in the art. This is because Appellants have acknowledged that Vectran<sup>TM</sup> is a known and available LCP that is bi-axially oriented and has a softening temperature of about 110 to 120 degrees Centigrade (Specification 6) and Harvey teaches that Vectra<sup>®</sup> are commercially available multi-axially oriented LCP polymers. In this regard, Harvey teaches that these polymers are suitable for use in forming coating films useful in the formation of laminate film composites for the aerospace industry and would have been recognized by one of ordinary skill in the art as a suitable and available LCP material for use in the claimed method of Clarke for the advantageous strength properties thereof (Harvey, col. 6, ll. 8-68). As for the curing temperature requirements of representative claims 1 and 4, respectively, it would have been obvious to one of ordinary skill in the art to determine an appropriate workable curing temperature for the claimed curing step of Clarke upon routine experimentation and in so doing arrive at the subject matter of representative claims 1 and 4, for substantially the reasons we discussed above with respect to the Examiner's § 103(a) rejection over Clarke in view of Harvey. After all, skill and not the converse is expected of an ordinarily skilled artisan. *In re Sovish*, 769 F.2d 738, 226 USPQ 771 (Fed. Cir. 1985). Concerning separately argued claim 6, we agree with the Examiner's obviousness assessment of the addition of an abrading step like that required for Appellants' claim 6 to the process of claim 1 of Clarke because the Examiner has made an uncontested finding of

fact with respect to abrading being a conventional step in the art and we agree that the addition of such a step to the claimed process of Clarke would have been recognized by one of ordinary skill in the art as being useful as an adjunct to the adhesive applying step of Clarke in obtaining a composite structure with an adequately adhered protective coating (Clarke; cl. 1, step (d)).

In light of the above, it follows that we shall sustain the Examiner's obviousness type double patenting rejection of the appealed claims over the claims of Clarke in view of Harvey.

#### CONCLUSION

The decision of the Examiner to reject claims 1-13 under 35 U.S.C. § 103(a) as being unpatentable over Clarke in view of Harvey; and to reject claims 1-13 under the judicially created doctrine of obviousness-type double patenting over claims 1-6 of Clarke taken in view of Harvey 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)(1)(iv) (2006).

AFFIRMED

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Appeal 2007-0906  
Application 10/445,238

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