

gas fuel.¹⁵⁴ Although this enzyme is already known to scientists because of its economic importance in farming, the technology to extract, grow and store large quantities of the enzyme has developed only recently.¹⁵⁵ If the technique advances much further, cars might be partially powered on their own gas, or even draw fuel from the air itself.¹⁵⁶ Would the fact that the material exists in nature be *per se* novelty-destroying for subsequent inventions? The jurisprudence on second (or subsequent) indications is limited to methods for treatment by surgery, therapy or diagnosis for human and animal body.¹⁵⁷ Perhaps a basis exists for exploring the adoption of a similar approach in the context of green inventions.

4. Non-obviousness: KSR and Green Technology

In the US, it may be difficult for some green inventions to meet the non-obviousness standards after the *KSR* decision.¹⁵⁸ Before *KSR*, the test for non-obviousness was primarily based on *Graham v. John Deere*:¹⁵⁹ *i.e.*, (i) the scope and content of the prior art need to be determined; (ii) differences between the prior art and the claims of the invention need to be verified; (iii) obviousness to the person with ordinary skill in the art is reviewed by considering “teaching, suggestion, or motivation” (the TSM test) at the time of invention; and (iv) secondary considerations such as scepticism of experts, unexpected results, long-felt need, failure of others, commercial success can be taken into account.¹⁶⁰

The *KSR* decision modified the non-obviousness standard by lifting the level of a person skilled in the art. The Supreme Court clarified that the Federal Circuit’s TSM test should be a flexible test because an obviousness determination is not the result of a rigid formula dissociated from consideration of the facts of the case.¹⁶¹ It further noted that “[t]he question is not whether the combination was obvious to the patentee, but whether the combination was obvious to persons with ordinary skill in the art.”¹⁶² Thus, the common sense of persons skilled in the art is the yardstick for determining why some combinations could have been obvious while others would not.¹⁶³ Importantly, following *KSR*, the Federal Circuit held in

154 Chi Chung Lee, Yilin Hu and Markus W. Ribbe, *Vanadium Nitrogenase Reduces CO*, 329 SCIENCE 642 (Aug. 6, 2010).

155 Eric Bland, *Gasoline From Thin Air?*, DISCOVERY NEWS, Aug. 5, 2010.

156 *Id.*

157 *Supra* note 120 at art. 53(c).

158 *KSR International Co. v. Teleflex Inc.*, et al., 550 U.S. 398 (2007).

159 *William T. Graham, et al. v. John Deere Co. of Kansas City, et al.*, 383 U.S. 1 (1966).

160 *Id.* See also Randall R. Rader, Chief Judge, U.S. Court of Appeals for the Federal Circuit, *Obviousness after KSR: Cases and Analysis* (on file with author).

161 *Supra* note 158.

162 *Id.*

163 *Id.* at 1739.

Leapfrog v. Fisher-Price that a person of ordinary skill in the art would have found it “obvious to combine the adaptation of an old idea with newer technology.”¹⁶⁴

In terms of the implications of *KSR*, since clean technologies often involve a “mosaicing of pre-existing technologies” (*i.e.*, combining more than one piece of prior art), it is important to draft patent claims so as to capture the integration of the several technologies in order to avoid an obviousness rejection under Section 103 of the U.S. Patent Act.¹⁶⁵

5. ‘Greenness’ and Utility Requirements

The discussions so far do not suggest a special rule for green technology under patent law. If an invention has ecologically sound effects, what should be considered for patenting is simply whether or not such invention is novel, non-obvious and useful, rather than its green effects. Especially in relation to utility, one may wonder if perhaps environmental soundness is ‘useful’ in terms of patent law and therefore must be considered as part of patentability requirements. A clue to the answer might be found in the development of the utility requirement under U.S. patent law.¹⁶⁶

Back in 1966, the Supreme Court in *Brenner v. Manson* held that usefulness is satisfied when “specific benefits exist in currently available form.”¹⁶⁷ Meanwhile, the *Application of Anthony* decision held that safety in treating humans is not a question of patent validity within Section 101 of the U.S. Patent Act, but that it is for the U.S. Food and Drug Administration (FDA) to test the safety or efficacy of pharmaceutical products.¹⁶⁸ Rejecting a special rule for the utility of pharmaceutical inventions, *Application of Antony* represented a lower threshold for the utility requirement. *In re Fisher* found that there was no substantial utility in an invention unless and until a process is refined and developed to the point where specific benefit exists in currently available form and that utility must be such that a person

164 *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157 (Fed. Cir. 2007). *See also* Rader, *supra* note 160.

165 Mark Sajewycz, Ogilvy Renault, *Patenting Clean Technologies: Trends, Issues and Strategies* (Jan. 21, 2010), at http://www.ogilvyrenault.com/en/resourceCentre_10025.htm.

166 *See generally* F. Scott Kieff, Lecture at the Munich Intellectual Property Law Center: Pharmaceuticals and IP (Summer 2010) (on file with author).

167 *Brenner, Commissioner of Patents v. Manson*, 383 U.S. 519 (1966).

168 *In re Application of Anthony*, 414 F.2d 1383 (C.C.P.A. 1969) (noting that the safety question may be an issue under the enablement requirement in Section 112 of the U.S. Patent Act. Enablement matters if the disclosure includes an element on safety or effectiveness for treating humans, but it is the FDA that has to verify such safety or effectiveness.).