

1 UNITED STATES PATENT AND TRADEMARK OFFICE

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4 BEFORE THE BOARD OF PATENT APPEALS  
5 AND INTERFERENCES  
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8 *Ex parte* JEFFREY D. HAYNES and STUART A. SANDERS  
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11 Appeal 2008-4434  
12 Application 10/401,427  
13 Technology Center 3700  
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16 Decided: October 28, 2008  
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19 *Before:* WILLIAM F. PATE, III, JENNIFER D. BAHR, and  
20 FRED A. SILVERBERG, *Administrative Patent Judges.*

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22 SILVERBERG, *Administrative Patent Judge.*  
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25 DECISION ON APPEAL  
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27 STATEMENT OF THE CASE

28 Appellants appeal under 35 U.S.C. § 134 (2002) from a Final Office  
29 Action of claims 1-9. We have jurisdiction under 35 U.S.C. § 6(b) (2002).



1 Yamamuka. This issue turns on whether: (1) the Examiner has failed to  
2 articulate a reason with rational underpinning to combine the teachings of  
3 Alkhimov in view of Yamamuka; and (2) the Examiner has failed to identify  
4 art, even when the references are combined, that teaches or suggests all of  
5 the limitations of the independent claims, as neither Alkhimov nor  
6 Yamamuka discloses any recognition of the problem of nozzle clogging, or  
7 that clogging problems could be solved by forming the divergent section of  
8 the spray nozzle from polybenzimidazole.

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#### FINDINGS OF FACT

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We find that the following enumerated findings are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

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1. The Appellants' Specification discloses a system 10 for cold spraying a powder coating to a surface of a product, the system comprising a supersonic nozzle 4 having a passageway 18 of profiled cross-section (one dimension of its flow-section being larger the other dimension), the passageway having a converging section 100 and a diverging section 102 (Figs. 1, and 2), wherein at least the converging section being formed from polybenzimidazole to prevent clogging of the passageway 18 (p. 6, ll. 14-26).

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2. The Appellants' Specification further discloses that polybenzimidazole has excellent erosion resistance properties (p. 6, l. 25).



1           “Section 103 forbids issuance of a patent when ‘the differences  
2 between the subject matter sought to be patented and the prior art are such  
3 that the subject matter as a whole would have been obvious at the time the  
4 invention was made to a person having ordinary skill in the art to which said  
5 subject matter pertains.’” *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727,  
6 1734 (2007). The question of obviousness is resolved on the basis of  
7 underlying factual determinations including (1) the scope and content of the  
8 prior art, (2) any differences between the claimed subject matter and the  
9 prior art, (3) the level of skill in the art, and (4) where in evidence, so-called  
10 secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18  
11 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these  
12 questions might be reordered in any particular case, the [*Graham*] factors  
13 continue to define the inquiry that controls.”)

14           In *KSR*, the Supreme Court emphasized “the need for caution in  
15 granting a patent based on the combination of elements found in the prior  
16 art,” *id.* at 1739, and discussed circumstances in which a patent might be  
17 determined to be obvious. In particular, the Supreme Court emphasized that  
18 “the principles laid down in *Graham* reaffirmed the ‘functional approach’ of  
19 *Hotchkiss*, 11 How. 248.” *KSR*, 127 S. Ct. at 1739 (citing *Graham*, 383 U.S.  
20 at 12), and reaffirmed principles based on its precedent that “[t]he  
21 combination of familiar elements according to known methods is likely to be  
22 obvious when it does no more than yield predictable results.” *Id.*

23           The Court explained:

24                   When a work is available in one field of endeavor,  
25                   design incentives and other market forces can  
26                   prompt variations of it, either in the same field or a  
27                   different one. If a person of ordinary skill can

1           implement a predictable variation, § 103 likely  
2           bars its patentability. For the same reason, if a  
3           technique has been used to improve one device,  
4           and a person of ordinary skill in the art would  
5           recognize that it would improve similar devices in  
6           the same way, using the technique is obvious  
7           unless its actual application is beyond his or her  
8           skill.

9       *Id.* at 1740. The operative question in this “functional approach” is thus  
10       “whether the improvement is more than the predictable use of prior art  
11       elements according to their established functions.” *Id.*

12           The Supreme Court stated that there are “[t]hree cases decided after  
13       *Graham* [that] illustrate the application of this doctrine.” *Id.* at 1739. “In  
14       *United States v. Adams*, ... [t]he Court recognized that when a patent claims  
15       a structure already known in the prior art that is altered by the mere  
16       substitution of one element for another known in the field, the combination  
17       must do more than yield a predictable result.” *Id.* at 1739-40. “*Sakraida*  
18       *and Anderson’s-Black Rock* are illustrative – a court must ask whether the  
19       improvement is more than the predictable use of prior art elements according  
20       to their established function.” *Id.* at 1740.

21           The Supreme Court stated that “[f]ollowing these principles may be  
22       more difficult in other cases than it is here because the claimed subject  
23       matter may involve more than the simple substitution of one known element  
24       for another or the mere application of a known technique to a piece of prior  
25       art ready for the improvement.” *Id.*

26           The Court explained:

27                   Often, it will be necessary for a court to look to  
28                   interrelated teachings of multiple patents; the  
29                   effects of demands known to the design  
30                   community or present in the marketplace; and the

1 background knowledge possessed by a person  
2 having ordinary skill in the art, all in order to  
3 determine whether there was an apparent reason to  
4 combine the known elements in the fashion  
5 claimed by the patent at issue.

6 *Id.* at 1740-41. The Court noted that “[t]o facilitate review, this analysis  
7 should be made explicit.” *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Fed.  
8 Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by  
9 mere conclusory statements; instead, there must be some articulated  
10 reasoning with some rational underpinning to support the legal conclusion of  
11 obviousness”). However, “the analysis need not seek out precise teachings  
12 directed to the specific subject matter of the challenged claim, for a court  
13 can take account of the inferences and creative steps that a person of  
14 ordinary skill in the art would employ.” *Id.*

15 The Federal Circuit recently concluded that it would have been  
16 obvious to combine (1) a mechanical device for actuating a phonograph to  
17 play back sounds associated with a letter in a word on a puzzle piece with  
18 (2) an electronic, processor-driven device capable of playing the sound  
19 associated with a first letter of a word in a book. *Leapfrog Ent., Inc. v.*  
20 *Fisher-Price, Inc.*, 485 F.3d 1157, 1161 (Fed. Cir. 2007) (“[a]ccommodating  
21 a prior art mechanical device that accomplishes [a desired] goal to modern  
22 electronics would have been reasonably obvious to one of ordinary skill in  
23 designing children’s learning devices”). In reaching that conclusion, the  
24 Federal Circuit recognized that “[a]n obviousness determination is not the  
25 result of a rigid formula disassociated from the consideration of the facts of a  
26 case. Indeed, the common sense of those skilled in the art demonstrates why  
27 some combinations would have been obvious where others would not.” *Id.*  
28 at 1161 (citing *KSR*, 127 S.Ct. 1727, 1739 (“The combination of familiar

1 elements according to known methods is likely to be obvious when it does  
2 no more than yield predictable results.”)). The Federal Circuit relied in part  
3 on the fact that Leapfrog had presented no evidence that the inclusion of a  
4 reader in the combined device was “uniquely challenging or difficult for one  
5 of ordinary skill in the art” or “represented an unobvious step over the prior  
6 art.” *Id.* (citing *KSR*, 127 S.Ct. at 1740-41).

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### ANALYSIS

9 Appellants argue claims 1, 3, 5, 6 and 8 as a group. As such, we  
10 select claim 3 as representative of the group, and claims 1, 5, 6 and 8 will  
11 stand or fall with claim 3. 37 C.F.R. § 41.37(c)(1)(vii) (2007). The  
12 Appellants argue claims 2, 4, 7 and 9 separately.

13 Alkhimov discloses a system 10 for cold spraying a powder coating  
14 that is structurally identical to Appellants’ system (Fact 4). We find that the  
15 only difference between the two systems is that Alkhimov’s nozzle is  
16 formed of metal while Appellants’ nozzle is formed of polybenzimidazole.  
17 Alkhimov discloses that the metal nozzle is subject to intensive electric  
18 erosion and high-temperature exposure and, as a result, rapid erosion occurs  
19 (Fact 5). Yamamuka teaches making a nozzle out of polybenzimidazole  
20 instead of metal to exhibit heat resistant and solvent resistant characteristics  
21 (Fact 6). We conclude that to combine the teachings of Alkhimov and  
22 Yamamuka, as set forth by the Examiner (Ans. 3 and 4) by making the  
23 nozzle out of polybenzimidazole instead of metal to exhibit heat resistant  
24 and solvent resistant characteristics would have been obvious at the time the  
25 invention was made to a person having ordinary skill in the art. In *KSR* the  
26 Supreme Court held that if a technique has been used to improve one device

1 and a person of ordinary skill in the art would recognize that it would  
2 predictably improve similar devices in the same way, using the technique is  
3 obvious. *See KSR* at 1740.

4 Appellants argue that the Examiner has failed to provide motivation to  
5 combine the teachings of Alkhimov and Yamamuka, that is, there is no  
6 motivation in the prior art that would cause a person having ordinary skill in  
7 the art to make the proposed combination of references (Br. 5 and 6).

8 However, in *KSR* the Supreme Court held that a rigid application of such a  
9 mandatory formula as TSM [teaching, suggestion or motivation] was  
10 incompatible with its precedent concerning obviousness. *See KSR* at 1741.

11 Appellants further argue that there is no recognition in either of  
12 Alkhimov or Yamamuka that the clogging problem encountered in cold  
13 spray systems could be solved by forming at least the diverging section of  
14 the spray nozzle out of polybenzimidazole (Br. 4 and 5). The Appellants  
15 have not persuaded us that the Examiner erred in the modification of the  
16 teaching of Alkhimov by forming the nozzle out of polybenzimidazole as  
17 taught by Yamamuka (Ans. 3 and 4). We agree with Appellants that neither  
18 Alkhimov nor Yamamuka discloses solving a clogging problem. However,  
19 Alkhimov's nozzle is subject to erosion as a result of high-temperature  
20 exposure (Fact 5) and Yamamuka's polybenzimidazole nozzle exhibits heat  
21 resistant and solvent resistant characteristics (Fact 6). When confronted with  
22 an erosion problem due to high-temperature exposure, we conclude that a  
23 person having ordinary skill in the art would look to Yamamuka for a  
24 teaching of forming a nozzle out of polybenzimidazole. [T]he law does not  
25 require that the references be combined for the reasons contemplated by the

1 inventor. *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d  
2 1332, 1337 (Fed. Cir. 2005).

3         Still further, Appellants argue that neither of the references discloses  
4 forming both the converging and diverging sections of the nozzle from  
5 polybenzimidazole (cl. 2) (Br. 6), forming the converging section of the  
6 nozzle from polybenzimidazole (cl. 4) (Br. 6), or only forming the diverging  
7 portion of the nozzle from polybenzimidazole (cls. 7 and 9) (Reply Br. 6 and  
8 Br. 7). Again, Appellants have not persuaded us that the Examiner has  
9 erred. A person of ordinary skill in the art likely would have immediately  
10 envisaged forming the entire nozzle, that is, both the diverging and  
11 converging sections of polybenzimidazole, thereby satisfying the limitations  
12 of claims 2 and 4. As to claims 7 and 9, we find that Appellants have not  
13 attributed any significance to forming only the diverging section of the  
14 nozzle out of polybenzimidazole (Fact 5). Further, there appears to be no  
15 unexpected results seen to be attained by making only a part of the nozzle,  
16 the diverging section, out of polybenzimidazole as opposed to making the  
17 whole nozzle out of polybenzimidazole since whatever part of the nozzle is  
18 formed out of polybenzimidazole, that part of the nozzle would exhibit heat  
19 resistant and solvent resistant characteristics (Fact 6). Therefore, we  
20 conclude it would have been obvious at the time the invention was made to a  
21 person having ordinary skill in the art to form only the diverging section of  
22 the nozzle of Alkhimov out of polybenzimidazole by the teaching of  
23 Yamamuka. In *KSR* the Supreme Court held that “[t]he combination of  
24 familiar elements according to known methods is likely to be obvious when  
25 it does no more than yield predictable results.” *See id.* at 1739.

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CONCLUSION OF LAW

We conclude that the Appellants have not shown that the Examiner erred in rejecting claims 1-9 under 35 U.S.C. § 103(a) as being unpatentable over Alkhimov in view of Yamamuka.

DECISION

The decision of the Examiner to reject claims 1-9 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) (2007).

AFFIRMED

Appeal 2008-4434  
Application 10/401,427

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