

**United States Court of Appeals  
for the Federal Circuit**

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**CERAMTEC GMBH,**  
*Appellant*

v.

**COORSTEK BIOCERAMICS LLC, FKA C5  
MEDICAL WERKS, LLC,**  
*Appellee*

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2023-1502

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Appeal from the United States Patent and Trademark Office, Trademark Trial and Appeal Board in Nos. 92058781, 92058796.

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Decided: January 3, 2024

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JESSICA LYNN ELLSWORTH, Hogan Lovells US LLP, Washington, DC, argued for appellant. Also represented by ANNA KURIAN SHAW, REEDY SWANSON; KATHERINE BOOTH WELLINGTON, Boston, MA; JOHANNAH CASSEL-WALKER, San Francisco, CA.

STEVEN J. HOROWITZ, Sidley Austin LLP, Chicago, IL, argued for appellee. Also represented by CAROLINE A. WONG; DIANA RUTOWSKI, Orrick, Herrington & Sutcliffe LLP, Menlo Park, CA.

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Before LOURIE, TARANTO, and STARK, *Circuit Judges*.

LOURIE, *Circuit Judge*.

CeramTec GmbH (“CeramTec”) appeals from a decision of the United States Trademark Trial and Appeal Board (“the Board”) cancelling its trademarks which claim protection for the pink color of ceramic hip components. *Coorstek Bioceramics LLC f/k/a C5 Medical Werks, LLC v. CeramTec GmbH*, Nos. 92058781 & 92058796, 2022 WL 17547263 (T.T.A.B. Dec. 6, 2022) (“*Decision*”). For the reasons discussed below, we *affirm*.

#### BACKGROUND

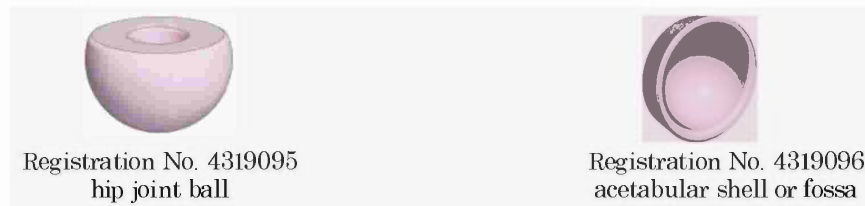
CeramTec manufactures artificial hip components used to replace damaged bone and cartilage in hip replacement procedures. The hip components are made from a zirconia-toughened alumina (“ZTA”) ceramic originally developed for use in cutting tools. The ZTA ceramic contains, among other things, chromium oxide (chromia). CeramTec markets the hip components under the name, “BioloX Delta.” *Decision* at \*15.

BioloX Delta’s chemical composition, including the addition of chromia, was the subject of CeramTec’s U.S. Patent 5,830,816 (“the ’816 patent”) until January 2013, when the patent expired. J.A. 1230. Claim element 3(e) of the ’816 patent is illustrative, claiming “the molar ratio between the [zirconia] . . . and the [chromia] amounting to 1,000:1 to 20:1.” ’816 patent col. 10, ll. 31–33. The ’816 patent’s specification and prosecution history discuss how adding chromia enables the claimed composition to obtain unprecedented levels of hardness. ’816 patent col. 3, ll. 62–63 (the addition of chromia “makes it possible for the first time to achieve hardness values such as have not previously been achieved”); J.A. 1628 (’816 patent prosecution history: similar). Increased hardness levels

enable the ZTA hip component to maintain its shape and resist deformation. *Decision* at \*13.

The amount of chromia in the ZTA ceramic affects its coloring. In fact, the range of chromia claimed in the '816 patent can produce ZTA ceramics in a variety of colors, such as pink, red, purple, yellow, black, gray, and white. BioloX Delta contains chromia at a 0.33 weight percentage (0.33%), which makes it pink. *Decision* at \*16, \*56. CeramTec has also applied for and received other patents that spoke to chromia's impact on ZTA ceramic hardness.

In January 2012, CeramTec applied for two trademarks claiming protection for the color pink used in ceramic hip components. In April 2013, the marks were registered on the Supplemental Register.



*Decision* at \*14; *see also* J.A. 107–10 (Supplemental Registration Nos. 4319095 and 4319096).

CoorsTek Bioceramics LLC, formerly known as C5 Medical Werks, LLC (“CoorsTek”), is a competitor to CeramTec in the medical-implant market. CoorsTek manufactures two ZTA ceramic materials for hip implants: (1) CeraSurf-p, which contains chromia, rendering it pink, and (2) CeraSurf-w, which does not contain chromia, rendering it white.

On March 3, 2014, CoorsTek filed a lawsuit in the District of Colorado and a cancellation petition with the Board, both seeking to cancel CeramTec's trademarks on the ground that the color pink claimed was functional. J.A.

491–500.<sup>1</sup> In response, at the Board, CeramTec argued that although it had once believed that adding chromia provided material benefits to ZTA ceramics, that belief was mistaken and has since been disproven.

The Board found in favor of CoorsTek and concluded that the color pink was functional as it relates to ceramic hip components. *Decision* at \*57. The Board analyzed the functionality of the marks under the four factors discussed in *In re Morton–Norwich Products, Inc.*, 671 F.2d 1332, 1340–41 (C.C.P.A. 1982), and also considered experimental testing conducted in a related German litigation, suggesting that chromia has no effect on the material properties of ZTA ceramic hip components. *Id.* at \*48–57.

Applying the *Morton–Norwich* factors, the Board found that CeramTec’s patents and public communications disclosed that the addition of chromia provides material benefits to ZTA ceramics, and therefore weighed in favor of functionality. *Id.* at \*49–54. Because there was no probative evidence as to whether Biolox Delta would work as well if made in colors apart from pink, the Board found this factor to be neutral with respect to functionality. *Id.* at \*54. And because there was conflicting evidence as to whether chromia decreases the cost of manufacturing ceramic hip components, the Board also found this factor neutral. *Id.* at \*55.

As for the testing suggesting that chromia had no effect on the material properties of ZTA ceramics, the Board found the experiments to be methodologically flawed, and

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<sup>1</sup> The district court proceeding was ultimately resolved on procedural grounds. *C5 MedicalWerks, LLC vs. CeramTec GmbH*, 937 F.3d 1319, 1323 (10th Cir. 2019) (vacating the district court decision based on a lack of personal jurisdiction).

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therefore chose not to factor the results into its functionality determination. *Id.* at \*55–56.

Lastly, the Board rejected CeramTec’s unclean hands defense, in which CeramTec argued that CoorsTek should be precluded from petitioning to cancel its trademarks on functionality grounds because CoorsTek had previously contended that chromia provided no material benefits to ZTA ceramics. *Id.* at \*57–58.

In sum, the Board cancelled the marks based on its conclusion that the marks are in fact functional. CeramTec appeals the Board’s decision. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(B) and 15 U.S.C. § 1071(a)(1).

#### DISCUSSION

A trademark is not registrable or is cancellable if the design described is functional. *See Valu Eng’g, Inc. v. Rexnord Corp.*, 278 F.3d 1268, 1273 (Fed. Cir. 2002). As the Supreme Court explained in *Qualitex Co. v. Jacobson Prods. Co.*:

The functionality doctrine prevents trademark law, which seeks to promote competition by protecting a firm’s reputation, from instead inhibiting legitimate competition by allowing a producer to control a useful product feature. It is the province of patent law, not trademark law, to encourage invention by granting inventors a monopoly over new product designs or functions for a limited time, 35 U.S.C. §§ 154, 173, after which competitors are free to use the innovation. If a product’s functional features could be used as trademarks, however, a monopoly over such features could be obtained without regard to whether they qualify as patents and could be extended forever (because trademarks may be renewed in perpetuity).

514 U.S. 159, 164–65 (1995).

Legal conclusions of the Board are reviewed *de novo*, and the factual findings of the Board are upheld when they are supported by substantial evidence. *In re Pacer Tech.*, 338 F.3d 1348, 1349 (Fed. Cir. 2003). A finding is supported by substantial evidence if a reasonable mind might accept the evidence as adequate to support the finding. *In re GO & Assocs., LLC*, 90 F.4th 1354, 1357 (Fed. Cir. 2024). The functionality of a mark is a question of fact. *In re Becton, Dickinson & Co.*, 675 F.3d 1368, 1372 (Fed. Cir. 2012); *Morton–Norwich*, 671 F.2d at 1340–41 (C.C.P.A. 1982) (establishing the *Morton–Norwich* factors for evaluating trademark functionality).

CeramTec raises two main arguments on appeal: (1) that the Board’s finding that its trademarks are functional was infected by legal error and unsupported by substantial evidence, and (2) that the Board erred by categorically precluding the defense of unclean hands in cancellation proceedings involving functionality.

## I

CeramTec first challenges the Board’s finding that its trademarks are functional. CeramTec asserts that the Board’s analysis with respect to the first *Morton–Norwich* factor was both factually and legally flawed and that the Board’s findings with respect to the third and fourth factors were not supported by substantial evidence. CeramTec also asserts that the Board’s findings as to the experimental testing were not supported by substantial evidence. And last, CeramTec contends that the Board erroneously placed the burden on it to prove that its trademarks were not functional. We address each argument in turn.

## A

As noted, the Board analyzed the functionality of CeramTec’s trademarks in part under the four factors set out in *Morton–Norwich*, 671 F.2d at 1340–41:

- (1) the existence of a utility patent disclosing the utilitarian advantages of the design;
- (2) advertising materials in which the originator of the design touts the design's utilitarian advantages;
- (3) the availability to competitors of functionally equivalent designs; and
- (4) facts indicating that the design results in a comparatively simple or cheap method of manufacturing the product.

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The Board concluded that CeramTec's patents were "strong evidence that the color pink for ceramic hip implant components is functional" under the first *Morton-Norwich* factor. *Decision* at \*52. In analyzing the first factor, the Board read the claims, specification, and prosecution history of the '816 patent to disclose the "functional benefits of chromia with respect to the toughness, hardness, stability and suppression of brittleness of the ZTA ceramic." *Id.* at \*51. The Board also considered CeramTec's other patents and applications, e.g., U.S. Patent 9,237,955 ("the '955 patent") and U.S. Patent Application 2012/0142237 ("the '237 application"), which it found disclosed that chromia increases the hardness and toughness of ZTA ceramics and makes ZTA ceramics suitable for medical applications. *Id.* And last, the Board considered CeramTec's concessions that the addition of chromia causes ZTA ceramics to become pink and that Biolog Delta practices at least one claim of the '816 patent. *Id.*

CeramTec makes two arguments challenging the Board's analysis under the first *Morton-Norwich* factor: (1) that the Board erred in reading the patents to attribute functional benefits to the addition of chromia other than hardness, and (2) that the Board improperly applied the

Supreme Court's decision in *TrafFix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23 (2001) to the facts of this case.

CeramTec contends that it was error for the Board to find that the patents disclose that chromia provides utilitarian advantages to ZTA ceramics in addition to increasing hardness. Although the patents mention other material benefits (toughness, stability, and suppression of brittleness), CeramTec asserts that the patents attribute them to other elements of ZTA ceramics (*e.g.*, zirconia). CeramTec, however, admits that the Board correctly read the '816 patent to attribute increased hardness levels of ZTA ceramics to the addition of chromia. CeramTec Br. at 10 (the "[816] patent, reflecting the understanding at the time, suggests that chromia in the amounts claimed contributes to the overall hardness of the ZTA ceramic"). We therefore need not consider whether the Board may have partially erred in its reading of the patents because the Board's analysis is equally supported whether the patents state that chromia accounts for only one or several material benefits.

As for *TrafFix*, CeramTec acknowledges that that case holds that utility patents can be "strong evidence" that the features therein claimed are functional, thus precluding trademark protection. However, CeramTec argues that *TrafFix* only applies when two threshold requirements are met. First, according to CeramTec, the utility patent must explicitly claim a design feature that the patent owner later seeks to trademark, and second, the goods for which trademark protection is sought must be the "central advance" of the patent—*i.e.*, the same goods mentioned in the patent. CeramTec asserts neither requirement is met here because the patents do not explicitly disclose material benefits for pink ZTA ceramics and do not discuss hip components, only cutting tools.

CeramTec supports its reading of *TrafFix* by pointing to the policy underlying the functionality doctrine. According



to CeramTec, the reason patented design features weigh in favor of finding a trademark functional is “because the public should be ‘free to use’ those features after the patent’s terms have ended.” Reply Br. at 12 (quoting *Qualitex*, 514 U.S. at 164). And here, CeramTec contends that the public is free to use CeramTec’s patents, so long as it does not “produc[e] a pink product.” Reply Br. at 12. We disagree with CeramTec’s reading of *TrafFix*.

In *TrafFix*, the Supreme Court explained that because utility patents are granted for “unique and useful” inventions, they are “strong evidence that the features therein claimed are functional.” *TrafFix*, 532 U.S. at 29, 31. Accordingly, “if trade[mark] protection is sought for those features[,]” the patent “great[ly] weigh[s]” in favor of finding the trademark functional. *Id.* at 29–30. *TrafFix* also explained that the functionality inquiry can be “aided by . . . examining the patent [specification] and its prosecution history to see if the feature in question is shown as a useful part of the invention.” *Id.* at 34. But nowhere does *TrafFix* hold that for a patent to be evidence of a claimed feature’s functionality, the patent must explicitly disclose that the claimed feature is functional. Nor does *TrafFix* state that for a trademark to be subject to a *TrafFix* analysis it must be used for the goods described in the patent. Rather, the “central advance” language was used by the *TrafFix* Court to illustrate why the patent in that case was particularly strong evidence that the design feature at issue was functional. *See id.* at 30.

The Board correctly applied *TrafFix* here. Recall CeramTec’s two concessions: (1) the addition of chromia causes a ZTA ceramic to become pink, and (2) that BioloX Delta practices at least one claim of the ’816 patent. *Decision* at \*51. These concessions establish that the ’816 patent claims a “feature[,]” the color pink, which CeramTec has trademarked. *TrafFix*, 532 U.S. at 30. The Board also considered the specifications and prosecution history of the

'816 patent, which state that the addition of chromia increases ZTA ceramic hardness. *Decision* at \*51; '816 patent col. 3, ll. 61–63 (the addition of chromia “makes it possible for the first time to achieve hardness values such as have not previously been achieved”); J.A. 1628 ('816 patent prosecution history: similar). And the Board supported its conclusion with CeramTec's other patents, which also disclose that chromia increases ZTA ceramic hardness. '955 patent col. 7, ll. 33–35 (“[T]he chromium addition counteracts any drop in the hardness values when the proportion of zirconium dioxide rises.”); *see also* '237 application, Abstract, (the addition of chromia to a ZTA ceramic is “particularly suitable for medi[c]al application”).

CeramTec's policy argument is likewise unpersuasive. The functionality doctrine is premised on the public being “free to use the innovation” after a patent has expired—not merely a part of the innovation. *Qualitex*, 514 U.S. at 164. That CeramTec only seeks to prevent the public (*i.e.*, CoorsTek) from practicing the narrow portion of its patents that claim a pink ZTA ceramic is beside the point. Permitting the public to use that innovation weighs in favor of finding functionality.

The Board therefore did not err in evaluating the first factor.

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The Board found that the second *Morton–Norwich* factor—advertising materials in which the originator of the design touts the design's utilitarian advantages—also “constitute[s] strong evidence of functionality.” *Decision* at \*54. In coming to this conclusion, the Board considered promotional and technical literature, as well as submissions made to the FDA, in which CeramTec stated that chromia provides various functional benefits to ZTA ceramics. *Id.* at 52–53.

CeramTec does not challenge the Board’s finding with respect to factor two. We accordingly need not review that ruling and turn to the Board’s analysis of the third factor.

## 3

The Board found the third factor—the availability of functionally equivalent designs—to be neutral with respect to functionality. *Id.* at 54. That finding was supported by substantial evidence.

As the Board recognized, there was no “probative evidence” that different-colored ceramic hip components were “equivalent in desired ceramic mechanical properties to those of [BioloX Delta].” *Id.* That lack of evidence was critical—for the third factor to weigh in favor of non-functionality, there must be evidence of actual or potential alternative designs “that work equally well” to the trademarked design. *Valu Eng’g*, 278 F.3d at 1276 (citation omitted).

CeramTec contends that the Board’s neutral determination was erroneous because the Board overlooked undisputed evidence of actual and potential ceramic hip components that are at least functionally equivalent to BioloX Delta: (1) statements made by CoorsTek that CeraSurf-w (CoorsTek’s white ceramic hip component) was functionally better than BioloX Delta, and (2) the ’816 patent, which can produce ZTA ceramics in a variety of colors in addition to pink. CeramTec mischaracterizes both the evidence and the Board’s analysis.

First, the evidence did not undisputedly provide that CeraSurf-w was functionally better than BioloX Delta. CoorsTek’s employee proffered that CeraSurf-w “is not as hard” as CeraSurf-p (CoorsTek’s pink ceramic), and thus not functionally better than BioloX Delta. *Decision* at \*40; J.A. 4911.

Second, as for the '816 patent, the Board began its analysis of the third factor by stating, “because of the technical challenges involved[,] there are only a few companies” capable of producing ceramic hip components. *Decision* at \*54. That suggests to us that the Board simply discounted all potential alternative designs because they are too theoretical. CeramTec’s argument thus amounts to a disagreement with the weight the Board assigned to the evidence, which we see no reason to disturb. *See GO & Assocs.*, 90 F.4th at 1357 (“reweighing the evidence is not the role of this court”) (internal quotation marks and citation omitted).

The Board’s determination that the third factor was neutral was therefore supported by substantial evidence.

## 4

The Board also found the fourth *Morton–Norwich* factor—whether the design results in a comparatively simple or cheap method of manufacturing the product—to be neutral. *Decision* at \*55.

As with the third factor, CeramTec again argues that the Board overlooked undisputed evidence providing that chromia makes Biolox Delta more expensive to manufacture, and therefore reversibly erred in not finding the fourth factor to weigh in favor of non-functionality. Once again, however, CeramTec mischaracterizes the evidence as undisputed. As the Board noted, CoorsTek proffered evidence that the cost of producing CeraSurf-p was “pretty similar” to its white components. *Id.* at 55; J.A. 13527. Accordingly, in light of the conflicting evidence, the Board reasonably found the factor to not weigh for or against functionality. *See GO & Assocs.*, 90 F.4th at 1357.

The Board’s determination that the fourth factor was neutral was therefore supported by substantial evidence.

## B

Next, the Board properly considered and rejected the results of several experiments conducted in a related German litigation in which a government-sponsored research agency found that the addition of chromia at various levels (0.0, 0.1, 0.3, and 0.5% by weight) had no effect on Biolox Delta's hardness or wear resistance. *Id.* at \*39, \*55–56.

The Board decided not to factor the results into its functionality determination for two reasons. First, the Board explained that it found CoorsTek's expert's criticisms of the testing's methodology to be "persuasive." *Id.* at \*55. And second, the Board found that the independent testing was incomplete because it did not address the full range of chromia that produces pink ZTA ceramics as claimed by the '816 patent. *Id.* The Board based the second critique on an internal CeramTec experiment demonstrating that chromia at levels above 0.5% by weight causes ZTA ceramics to become the pink color claimed in CeramTec's trademarks whereas the German-based testing did not evaluate levels above 0.5% by weight. *Id.*

CeramTec takes issue with both reasons the Board gave for discounting the results of the testing. With regard to the Board's statement that it found CoorsTek's expert persuasive, CeramTec argues that explanation was inadequate because it did not give the findings of the testing the "close attention" they deserved and ignored CeramTec's expert's rebuttal report, which provided a "point-for-point accounting" explaining why CoorsTek's expert's criticisms were misguided. CeramTec Br. at 44, 46. This, however, overlooks that the Board devoted an entire section of its opinion to discussing the methodology of the testing and both parties' expert's opinions of the testing. *Decision* at \*39. CeramTec's argument thus again amounts to a disagreement with the weight the Board

assigned to results of the independent testing, a finding which we have no basis to disturb. *See GO & Assocs.*, 90 F.4th at 1357.

CeramTec next contends that the Board's criticism of the independent testing was inapposite because CoorsTek's functionality challenge is to the exact amount of chromia used to produce Biolox Delta, 0.33% by weight, within the range of added chromia analyzed in the independent testing. That argument is misguided: the issue before the Board was whether the color pink claimed in CeramTec's trademarks is functional. The trademarks are not tied to a specific amount of chromia. *Decision* at \*1 ("The sole claim for protection in each registration is for the color pink only."). CeramTec's own internal experiment demonstrated that the pink color of ZTA ceramics claimed in its trademarks could be obtained at weight percentages above 0.5%. *Decision* at \*56; J.A. 10624. The Board therefore acted in accord with its role as factfinder in deciding to discount the results of the independent testing as incomplete.

### C

CeramTec's last argument regarding the Board's functionality determination is that the Board erroneously required it, the trademark owner, to prove that its trademarks were not functional. In support of its position, CeramTec points to the Board's emphasis on certain language in its discussion of the Supreme Court's decision in *TrafFix*. *E.g.*, *Decision* at \*50 ("Where the expired patent claimed the features in question, one who seeks to establish trade dress protection *must carry the heavy burden of showing that the feature is not functional*[.]") (quoting *TrafFix*, 532 U.S. at 29–30 (emphasis added by the Board)).

We are unpersuaded. The Board stated that "[CoorsTek] bears the burden of proving its Trademark Act Section 23(c) functionality claim by a preponderance of the

evidence.” *Decision* at \*2. After considering the evidence, the Board concluded that CoorsTek “ha[d] carried [its] burden” of proving that CeramTec’s trademarks are functional. *Id.* It correctly applied the burden of proof.

We accordingly see no reason to disturb the Board’s findings based on CeramTec’s burden shifting argument.

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In sum, because substantial evidence supports the Board’s factual findings, we affirm the Board’s conclusion that CeramTec’s trademarks are functional.

## II

We last consider the unclean hands issue. The doctrine of unclean hands “closes the doors of a court of equity to one tainted with inequity or bad faith relative to the matter in which he seeks relief, however improper may have been the behavior of the defendant.” *Gilead Scis., Inc. v. Merck & Co.*, 888 F.3d 1231, 1239 (Fed. Cir. 2018) (quoting *Precision Instrument Mfg. Co. v. Auto. Maint. Mach. Co.*, 324 U.S. 806, 814 (1945)).

CeramTec argued to the Board that CoorsTek should be precluded from asserting that CeramTec’s trademarks are functional because CoorsTek had long expressed the opposite: that chromia provides no material benefits for ZTA ceramics. J.A. 617–21. The Board disagreed, “hold[ing] . . . the unclean hands defense is unavailable in Board functionality proceedings in view of the prevailing public interest in removing registrations of functional marks from the register” and “find[ing] [CeramTec’s] unclean hands defense inapplicable.” *Decision* at \*58.

CeramTec contends that the Board erred, necessitating remand, by “refus[ing] to even consider the equitable circumstances” and “adopt[ing] a categorical rule” precluding the unclean hands defense in functionality proceedings. CeramTec Br. at 61.

We agree that the Board spoke too strongly by suggesting that the unclean hands defense was categorically unavailable in functionality proceedings. The Board's rules explicitly provide that the defendant, in cancellation proceedings before the Board, may "includ[e] the affirmative defense[] of unclean hands." 37 C.F.R. § 2.114(b)(2). It is not clear that the Board intended to announce a broad policy, as its conclusion is preceded by reference to its "discretion," which is generally exercised case-by-case, and the Board did not designate its decision as precedential. If, however, the Board intended to bar an unclean hands defense from all functionality proceedings, that would be error. Any such error was harmless here because the Board adequately considered whether the unclean hands defense was available in this case, as illustrated by its statement that it was "exercis[ing its] discretion" in view of the "strong public policy interest in" cancelling ineligible marks. *Decision* at \*58 (citing *Loglan Inst., Inc. v. Logical Language Grp., Inc.*, 962 F.2d 1038, 1042 (Fed. Cir. 1992) ("The Board did not err in declining to apply [equitable] defenses [in a cancellation proceeding], as the public interest . . . to rid the register of [an ineligible mark] transcends them.")).

#### CONCLUSION

We have considered CeramTec's remaining arguments and find them unpersuasive. For the foregoing reasons, we affirm the final decision of the Board.

**AFFIRMED**