

KEEPING THE DMCA AWAY FROM FUNCTIONAL USE

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I. INTRODUCTION

The Digital Millennium Copyright Act (DMCA) protects copyrighted works available in digital formats. It prohibits circumvention of digital locks that protect these works. This allows creators to make their works available for purchase on the internet without having to fear that file sharing will prevent them from profiting. The DMCA had the purpose of protecting copyright with the expansion of digital access, and it did not extend copyright protection to any works or aspects of a work that would not have been copyrightable under prior copyright. Unfortunately, the anticircumvention provisions of the DMCA have caused confusion over what copyright protects in functional works. This law has allowed makers of functional products, which would not otherwise warrant copyright protection, to sue for copyright liability in these products, when they have technological protection measures. As a result, the DMCA has inappropriately increased copyright protection beyond the scope of protecting an author's investment in a creative and original work.¹ In particular, the anticircumvention provisions have allowed makers of functional products, like calculators, appliances, and cars, to sue consumers who repair or modify those products.

Imagine you purchased a smart-home system, and you set it up to automate your thermostat and your outdoor lights; it opens your garage door when you get home from work, and you can now change your lighting, or lock your doors, with your smartphone. The price is \$299, but you expect it to be worth the investment due to the time and energy you will save. Then, the unexpected happens. The company that sold these systems announces it will sunset this product and completely shut down the background software service that makes the device function. You now have a useless \$299 plastic disc. This unfortunate scenario occurred for consumers that purchased a Revolv home system: Nest sunset the device just two years after acquiring the Revolv

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1. *See, e.g.*, AARON PERZANOWSKI & JASON SCHULTZ, THE END OF OWNERSHIP 144 (2016); *Unintended Consequences: Sixteen Years under the DMCA*, EFF (Sept. 2014), <https://www.eff.org/files/2014/09/16/unintendedconsequences2014.pdf>.

company.² To make matters worse, even if you wrote your own operating system for that device, so that it could work after the product line was shut down, the company that made it could hold you liable for bypassing any digital locks to replace the original programming with your own, due to section 1201 of the Digital Millennium Copyright Act.³

To address this issue, this Note recommends two possible solutions. First, courts could analyze whether the work—in this case the software—was accessed to infringe copyright or if the work was accessed for a non-infringing use, such as accessing the work to make changes or to fix functionality in the product. Second, Congress should enact a permanent statutory exemption for non-infringing uses that would prevent owners from being liable for mere circumvention of a digital lock on items they have already purchased. This statutory revision would provide clarity in a way that the temporary exemptions for repair have been unable, and it would keep the law up to date when new technologies emerge that the temporary exemptions do not cover.

This Note begins by discussing the background of the DMCA anticircumvention provisions in Part II. Section III.A shows that prior to the DMCA, functionality in copyrightable works did not have copyright protection. Section III.B proposes reasoning courts could use when determining when circumvention violates section 1201. Then, as a more feasible solution, in Section III.C, this Note proposes a more expansive permanent exemption to allow non-infringing and fair uses under the DMCA anticircumvention provisions so that courts can reach consistent outcomes when adjudicating section 1201 violations. Part IV then discusses some additional reasons why the DMCA anticircumvention provisions should not be interpreted to provide copyright protection for functionality.

II. BACKGROUND ON DMCA SECTION 1201 AND COPYRIGHT LAW

A. DMCA SECTION 1201

The Digital Millennium Copyright Act (DMCA) addresses how copyrighted materials can lawfully be used in digital media and contains provisions which address liability for copyright infringement in the digital age.⁴

2. Kyle Wiens, *Nest to Brick Revolt, Pull the Plug on Smarthomes*, iFIXIT (June 17, 2016), <https://www.ifixit.com/News/nest-bricks-revolv>.

3. *Id.*

4. U.S. COPYRIGHT OFFICE, SECTION 1201 OF TITLE 17: A REPORT OF THE REGISTER OF COPYRIGHTS 1 (2017), *available at* <https://www.copyright.gov/policy/1201/section-1201-full-report.pdf> [hereinafter SECTION 1201]. The DMCA also was enacted to fulfill

Section 1201 of this act prohibits “[c]ircumvention of [t]echnological [m]easures” that protect copyrighted works.⁵ For example, a website or piece of software may be protected by a password, or encrypted, so that only those who have paid for access may use it. Breaking that encryption or password as a non-paying customer would violate section 1201.⁶

However, not all actions taken to get around such technological protection measures (TPMs) are prohibited by law. In fact, section 1201 lists several permanent exemptions, such as allowances for law enforcement and specific types of encryption research.⁷ These are part of the statute itself and were established by Congress “out of recognition of the importance of these activities.”⁸ Additional permanent exemptions can be passed by Congress, and unlike the temporary exemptions discussed below, permanent statutory exemptions are not limited to “specific classes of works” (such as sound recordings or computer programs for smart TVs).⁹ As a result, permanent exemptions provide better clarity to users engaging in an exemption activity, for devices that do not properly fit into one of the temporary exemption classes of works.¹⁰

The temporary exemptions are updated triennially; the statute itself does not set out the exact process for updating them, but the Copyright Office has established a procedure that allows interested parties to give input. Currently, the Office classifies the proposed exemptions roughly based on whether the copyrighted works are distributed similarly and whether the works have similar uses to which the exemption may apply.¹¹ The Copyright Office then administers three rounds of public comment submissions.¹² Parties in support

international treaty obligations: the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty. *Id.*

5. 17 U.S.C. § 1201(a) (2012).

6. *Id.* § 1201(a)(1)(A).

7. *Id.* §§ 1201(e), (g). Other permanent exemptions include uses by non-profit libraries and educational institutions, uses by minors, and to protect personally identifiable information. *Id.* §§ 1201(d), (f), (h)–(i).

8. SECTION 1201, *supra* note 4, at 14.

9. *Id.* at 92–93.

10. *Id.*

11. KARYN A. TEMPLE, SECTION 1201 RULEMAKING: SEVENTH TRIENNIAL PROCEEDING TO DETERMINE EXEMPTIONS TO THE PROHIBITION ON CIRCUMVENTION, RECOMMENDATION OF THE ACTING REGISTER OF COPYRIGHTS, at 14 (2018), *available at* https://cdn.loc.gov/copyright/1201/2018/2018_Section_1201_Acting_Registers_Recommendation.pdf [hereinafter ACTING REGISTER'S RECOMMENDATION].

12. *See* SECTION 1201, *supra* note 4, at 24. For example, in the Seventh Triennial Rulemaking Process, the Copyright Office considered twelve classes including, “[l]iterary works – compilations of data generated by implanted medical devices – to access personal data,” “[c]omputer programs – ‘jailbreaking’ of smartphones, smart TVs, tablets, or other all-

of the exemption submit comments in the first and third rounds while parties which oppose the exemption submit comments during the second round.¹³ Those supporting the exemption have to show that the alleged harm from not granting the exemption is supported by a preponderance of the evidence.¹⁴ They must show that “users of a copyrighted work” will be “adversely affected . . . in their ability to make non-infringing uses . . . of a particular class of copyrighted works.”¹⁵ Non-infringing uses include fair use and other limitations on the scope of copyright protection afforded under the Copyright Act.¹⁶ In order to show that there will be adverse effects, the interested party must “demonstrate ‘distinct, verifiable, and measurable impacts’ occurring in the marketplace.”¹⁷ This burden of proof falls on the party proposing an exemption; opposed parties must then show that this demonstration of adverse effects was insufficient.¹⁸ The National Telecommunications and Information Administration (NTIA) and Acting Register of Copyrights both analyze the comments submitted and issue their own recommendations to the Copyright Office.¹⁹

Under section 1201, fair use and other limitations can influence which temporary exemptions are enacted in the Code of Federal Regulations. However, prior to the DMCA, non-infringing or fair uses did not need exemptions because it was understood that they did not violate the copyright holders’ rights. Prior to the DMCA, most courts allowed non-infringing uses of functionality within copyrightable works. In contrast, under the DMCA, some courts, as well as the Copyright Office, have held that non-infringing or fair uses still violate the DMCA if they do not have an exemption, and as a result, exemptions are required in order to decidedly avoid liability.

This issue has been addressed to some extent in the granted temporary exemptions, but the temporary exemptions alone are not enough. The current temporary exemptions do allow the repair of certain classes of items, but repair

purpose mobile computing devices,” and “[a]udiovisual works – educational and derivative uses,” to name a few. ACTING REGISTER’S RECOMMENDATION, *supra* note 11, at 23–27.

13. *See* SECTION 1201, *supra* note 4, at 24–25.

14. *See id.* at 26.

15. 17 U.S.C. § 1201(a)(1)(C).

16. ACTING REGISTER’S RECOMMENDATION, *supra* note 11, at 15.

17. *Id.* at 17 (citing Commerce Comm. Report).

18. *Id.* at 16–17.

19. NAT’L TELECOMM. & INFO. ADMIN., SEVENTH TRIENNIAL SECTION 1201 RULEMAKING: RECOMMENDATIONS OF THE NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION TO THE REGISTER OF COPYRIGHTS 1 (2018), *available at* https://www.ntia.doc.gov/files/ntia/publications/ntia_dmca_consultation_09252018.pdf [hereinafter NTIA RECOMMENDATIONS]; ACTING REGISTER’S RECOMMENDATION, *supra* note 11, at 1.

is still not allowed for all types of goods. The current repair exemptions only concern bypassing TPMs to diagnose or repair software that affects the functioning of what were, historically, “dumb items.”²⁰ As more devices contain software, it becomes more likely that one will need to access the software to make repairs when the device stops working, or malfunctions. Temporary exemptions can only apply to specific classes of works, so each Triennial Rulemaking Process’s repair exemptions are generally underinclusive.²¹ Additionally, the temporary exemption review process itself is burdensome for advocacy organizations to establish temporary exemptions that generally benefit the public.²²

In the 2018 Triennial Rulemaking Process, temporary exemptions for repair were an important focus. The Electronic Frontier Foundation (EFF) and several other organizations proposed a broader repair exemption which would include more Internet of Things devices, as well as video game consoles, because these devices often have some of the same repair issues.²³ The NTIA found that accessing software in phones and appliances for repairs would likely qualify as a non-infringing use of copyrighted work because it would be fair use.²⁴ Additionally, the NTIA found an adverse effect to consumers, due to the need to circumvent security measures in order to make repairs to devices one already owns.²⁵ The Acting Register agreed in recommending that smartphones and home appliances be included in the exemption to circumvention for repair and diagnostics.²⁶ However, video game consoles were not recommended to be exempt because widespread warranties and low-cost repair options from the manufacturers made it less likely users would experience adverse effects.²⁷ This conclusion and the recommendations

20. 37 C.F.R. § 201.40 (2016). Prior to the Internet of Things, home appliances, vehicles, and home systems did not have software, and, as a result, these types of items could not have had TPM protection nor fall under § 1201. PERZANOWSKI & SCHULTZ, *supra* note 1, at 140; Derek Russell Chipman, Note, *More Breaking, Less Rulemaking: Why Congress Should Go Beyond the Copyright Office’s Section 1201 Report and Amend the DMCA to Require a Nexus to Infringement*, 33 BERKELEY TECH. L.J. 1067, 1079 (2018).

21. *See* SECTION 1201, *supra* note 4, at 92–93.

22. *Id.* at 128–29 (“The commitment was keenly felt by individuals . . . [whose] participation in the rulemaking process competed with demands of their occupations, and by other communities, including the blind, visually impaired, and print-disabled, who have come to rely upon an exemption but must go through the process again each rulemaking.”).

23. ACTING REGISTER’S RECOMMENDATION, *supra* note 11, at 184–85.

24. NTIA RECOMMENDATIONS, *supra* note 19, at 51.

25. *Id.*

26. ACTING REGISTER’S RECOMMENDATION, *supra* note 11, at 216–17.

27. *Id.* at 220.

overall, though, ignore that bypassing TPMs for repair, which only involves the functionality of the device, should not be protected by copyright.²⁸

In the final ruling on October 26, 2018, the exemptions closely matched the recommendations from the Acting Register, instead of broader repair exemptions, which would have recognized the overreach of the DMCA into non-copyrightable items. A previous exemption for land-use vehicles was granted again, and an exemption was also granted to bypass TPMs to diagnose or repair smartphones, smart appliances, and smart home systems.²⁹ The exemptions do not mention, or extend to, other devices, such as video game consoles or computers.³⁰ EFF lamented that the current temporary exemptions still do not extend protections to all right-to-repair uses.³¹

Finally, because this is a temporary exemption, public interest organizations in support of this exemption will have to participate in the subsequent rulemaking processes triennially for as long as they want to advocate for this statutory exemption. The Copyright Office also recognized this burden, as well as the fact that the temporary exemptions only apply to specific classes of works, so temporary exemptions regarding repair will likely not adequately cover all types of devices, which might warrant circumvention in order to repair.³² Overall, the temporary exemption process failed to adequately curtail copyright protection of functional devices.³³

28. See *infra* discussion in Section III.B.

29. 37 C.F.R. §§ 201.40(b)(9)–(10) (2019).

30. See 37 C.F.R. § 201.40(b).

31. See, e.g., Mitch Stoltz, *New Exemptions to DMCA Section 1201 are Welcome, but Don't Go Far Enough*, EFF (Oct. 26, 2018), <https://www.eff.org/deeplinks/2018/10/new-exemptions-dmca-section-1201-are-welcome-dont-go-far-enough>.

32. SECTION 1201, *supra* note 4, at 92–93.

33. An additional concern in the anticircumvention law, with its current exemptions, is that the law violates the First Amendment. An ongoing case brought by the EFF on behalf of the plaintiffs alleges that the “threat of enforcement” of section 1201 “chills protected and non-infringing speech that relies on copyrighted works,” making the statute unconstitutional. Complaint at 2, *Green v. U.S. Dep’t of Justice*, 1:16-cv-01492-EGS (D.D.C. 2016), available at <https://www.eff.org/document/1201-complaint>. The EFF’s argument for how section 1201 burdens speech is that the granted exemptions have been too narrow to adequately address many non-infringing uses and therefore chills speech. *Id.* at 9–10. So far, the case has been allowed to continue past summary judgment on the issue of whether section 1201 substantially burdens more speech than necessary. *Green v. U.S. Dep’t of Justice*, 1:16-cv-01492-EGS, at 46 (D.D.C. June 27, 2019), available at <https://www.eff.org/document/green-v-doj-memorandum-opinion>. Notably, the plaintiffs in the case represent uses similar to modification and repair; Dr. Green publishes works on how to fix security flaws, and Dr. Huang develops technology for modifying digital video streaming. *Green v. U.S. Department of Justice*, EFF, <https://www.eff.org/cases/green-v-us-department-justice> (last visited Feb. 17, 2020).

The Copyright Office's current interpretation and exemption recommendations could lead to problematic results. The temporary exemptions for repair do not fully allow non-infringing uses, because the accessed work is entirely functional. However, court interpretations of the current DMCA law, or further revision of section 1201, could prevent such an issue and allow section 1201 to better align with existing copyright protections.

B. COPYRIGHT LAW GENERALLY

Copyright generally does not protect facts, functionality, or other technical operations. Instead, copyright law protects original works of authorship, which means that works must meet "a minimal requirement of creativity," in addition to being independently created.³⁴ However, when a copyrightable work contains non-copyrightable functional or factual material, the copyright protection does not extend to the facts or functionality themselves.³⁵ The purpose of copyright protection is to promote progress and innovation by allowing creators to recover the time and cost invested in making a creative work.³⁶ Copyright protection of software and other similar works does not extend to any "idea, procedure, process, system, method of operation, concept, principle, or discovery."³⁷ However, the expression and explanation of a "method of operation," a process, or a system is protectable, while the general use of those abstract principles is not.³⁸

III. COPYRIGHT PROTECTION OF FUNCTIONAL WORKS IN CASELAW

A. CASE LAW PRIOR TO THE DMCA

The following two cases illustrate how underlying functionality is not protected by copyright, and they demonstrate how copyright protection has changed with the DMCA to include protection for non-copyrightable elements in copyrighted works.

1. *Baker v. Selden*

In *Baker v. Selden*, Selden, the author of a book on a particular book-keeping method, sued Baker for copyright infringement because Baker used the forms

34. 1 NIMMER ON COPYRIGHT § 2.01(B)(1).

35. *Id.* § 2.11(A).

36. Nicolo Zingales, *Digital Copyright, "Fair Access" and the Problem of DRM Misuse*, B.C. INTEL. PROP. & TECH. F. (2012), at 4, <http://bciptf.org/wp-content/uploads/2012/08/DRM-final.pdf>.

37. 17 U.S.C. § 102(b).

38. 17 U.S.C. § 102(b); 1 NIMMER ON COPYRIGHT § 2.11(A).

from the book, as well as the book-keeping system disclosed in Selden's account-books.³⁹ Even though Baker copied the forms from Selden's book, the Court did not find that Baker infringed on Selden's copyright because Baker did not copy them to put into his own publishable work but rather to use in his own book-keeping records.⁴⁰ The Court explained how far copyright protection extends in a work that explains facts or explains a functional system. The Court used the example of a book on mathematics: the copyright "cannot give to the author an exclusive right to the methods of operation which he propounds," but instead, the copyright only protects the author's book itself from being copied by others without permission.⁴¹ To have protection in the functional innovation and its use, the author of any such book would need to secure a patent instead (although here the book-keeping forms would likely not qualify for patent protection either).⁴²

This case draws a clear line in the amount of copyright protection available to books describing something functional or factual.⁴³ For copyright protection, functional aspects of a work can be treated in the same way as facts. The expression of the functions or facts in a creative way can have copyright protection, but the facts or functions themselves are not copyrightable. This reasoning can be extrapolated to any copyrightable work which expresses functionality.⁴⁴ The takeaway of the case is that Baker did not infringe "because he used the forms as *tools* and not as *works*."⁴⁵ In other words, "he copied the plaintiff's *invention*, not the plaintiff's *work*."⁴⁶

For example, the drawing in a patent file is, as an original work, copyrightable.⁴⁷ However, after the patent term expires, the patent owner cannot then sue for copyright infringement those who re-create the patented invention to exactly match the copyrightable drawings. Allowing the patent owner to sue for infringement via the drawings would provide a "back-door" extension of the patentee's monopoly.⁴⁸ Basically, one cannot use copyright to extend protection for innovation that does not qualify for intellectual

39. Baker v. Selden, 101 U.S. 99, 100–01 (1879).

40. *Id.* at 107.

41. *Id.* at 103.

42. *Id.*

43. ABRAHAM DRASSINOWER, WHAT'S WRONG WITH COPYING? 91 (2015) ("[T]he copyright is as operative and as ordinary as would a copyright in the text of a recipe or a work on mathematical science. . . . [However], the copyright in his work is not an exclusive right to the content expressed in that work.").

44. *See id.*

45. *Id.* at 93.

46. *Id.*

47. *Id.* at 105.

48. *Id.*

property protection (such as a mathematical function) or that could be protected by patent.

2. *Lotus v. Borland*

Building on this idea, the court in *Lotus v. Borland* found that using the same menu command hierarchy from a competitor's copyrighted software did not infringe Lotus's software copyright.⁴⁹ In this case, Borland released a spreadsheet program that used the same menu commands as Lotus's spreadsheet program, so that users of the Lotus program could switch to Borland's without having to re-do their macros or learn new commands to do the same functions.⁵⁰ The court held that Lotus's command hierarchy was a "method of operation" because one had to use the commands in order to make use of the spreadsheet program.⁵¹ As a method of operation, the command hierarchy could not be copyrighted.⁵²

The reasoning in this case demonstrates how even some of the creative aspects of a functional work, such as the words used to represent various computer functions, may not be copyrightable.⁵³ Although Borland could have used synonyms of the commands from Lotus, the benefit to users from standardization mattered more than protecting copyright of the program commands.⁵⁴ The expressive components of the method of operation do not change it from being a method or process, which cannot be copyrighted.⁵⁵

Copyright prior to DMCA section 1201 did not protect computer programs and other expressions of functionality or facts. Prior to the anticircumvention provisions, modifying or repairing software code usually would not have been found to violate copyright law because the modifications would be making use of the functionality or, even when copied to build on the existing program, because of the practicality of using standard options.

49. *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 817, *aff'd*, 516 U.S. 233 (1996).

50. *Id.* at 810.

51. *Id.* at 815.

52. *Id.*

53. *Id.* ("The initial inquiry should not be whether individual components of a menu command hierarchy are expressive, but rather whether the menu command hierarchy as a whole can be copyrighted.")

54. *Id.* at 817–18 (finding that requiring users "to learn not just one method of operating the computer such that it prints, but many different methods . . . [is] absurd"); see Dan L. Burk, *Method and Madness in Copyright Law*, 2007 UTAH L. REV. 587, 591 (2007) ("Having learned one command structure, users would become confused or would incur the personal expense of relearning new commands each time they tried to change products. The benefits of standardization created a functional merger, if not an expressive merger.")

55. *Id.* at 592.

B. CASELAW ANALYZING SECTION 1201: REQUIRING COPYRIGHT INFRINGEMENT

Requiring copyright infringement in addition to circumvention of a digital lock would allow the DMCA's anti-circumvention provisions to further the progress of innovation and creativity. Such a requirement could either come from an established interpretation from the Supreme Court or from revision of the current statute. To allow repair or modification, courts could take a closer look at whether the accessed work was copyrightable, or if only functionality was accessed or used. If only functionality was accessed, then the courts could hold that the DMCA does not apply to the circumvention at issue. Alternatively, Congress could pass a permanent exemption for non-infringing uses, which would allow modification and repair, and this exemption could clear up confusion amongst circuits and result in more consistent decisions.

1. *The Circuit Split: Do Courts Require Infringement?*

Currently, interpretation of violation of the DMCA lacks consistency across circuits. Some courts have interpreted section 1201 to require copyright infringement, in addition to circumvention, in order for violation to have occurred, while others have determined that section 1201 only requires circumvention of a TPM protecting a copyrighted work in establishing liability.

a) *Chamberlain*: Requiring Copyright Infringement

In *Chamberlain v. Skylink*, the Federal Circuit held that the anticircumvention provisions “establish causes of action for liability” rather than a “new property right.”⁵⁶ Because the DMCA did not create a new property right, the plaintiff would need to show that the defendant lacked authorized access, meaning that the plaintiff would need to show that the defendant infringed on the plaintiff's copyright.⁵⁷ In this case, the plaintiff, Chamberlain, which sold electronically secure garage door openers, sued Skylink, a company which made a remote transmitter that could operate with their garage door opener system.⁵⁸ The transmitter “circumvented” the digital lock on the garage door system by broadcasting three signals which forced the system to operate in response to Skylink's transmitter.⁵⁹ From this circumvention alone, Chamberlain sued Skylink for violation of the DMCA; notably Chamberlain did not also sue for copyright infringement or

56. *Chamberlain Group, Inc. v. Skylink Techs., Inc.*, 381 F.3d 1178, 1192 (Fed. Cir. 2004).

57. *Id.* at 1193.

58. *Id.* at 1183.

59. *Id.* at 1185.

contributory copyright infringement, even though one would expect such claims to accompany a lawsuit concerning copyright law.⁶⁰

The Federal Circuit held that Chamberlain interpreted the scope of the DMCA's protections beyond what Congress intended.⁶¹ The court found such an interpretation conflicted with "the DMCA's statutory prescription that 'nothing in this section shall affect rights, remedies, limitations, or defenses to copyright infringement, including fair use, under this title.'"⁶² The court further expressed concern that Chamberlain's interpretation of the anticircumvention provision would lead to aftermarket monopolies: "any manufacturer of any product [could] add a single copyrighted sentence or software fragment to its product, wrap the copyrighted material in a trivial 'encryption' scheme, and thereby gain the right to restrict consumers' rights to use its products in conjunction with competing products."⁶³ The court also worried that establishing liability through circumvention alone would substantially limit non-infringing uses as well as established fair uses.⁶⁴

b) *MDY Industries*: Section 1201 Creates a New Property Right

The Ninth Circuit, however, declined to follow the Federal Circuit's interpretation of the anticircumvention law. In *MDY Industries v. Blizzard*, the court found that MDY Industries violated section 1201(a)(2), (which prohibits producing a device designed primarily for circumventing a TPM) even though it did not infringe on Blizzard's copyrights.⁶⁵ In this case, MDY released a bot that automated play through early levels of World of Warcraft, a videogame owned by Blizzard.⁶⁶ Blizzard, aware of such bots and trying to prevent them, launched Warden, which prevented players that used bots, like the one MDY released, from connecting to the game's servers.⁶⁷ MDY then updated the bot to avoid detection from Warden, effectively "bypassing" this digital protection for purposes of section 1201.⁶⁸ Because MDY's bot did not "alter or copy WoW software," both MDY and users of the bot did not infringe Blizzard's copyrights.⁶⁹ As a result, the court did not find MDY to be liable for direct or contributory copyright infringement.⁷⁰ Even though no copyright

60. *Id.*

61. *Id.* at 1197.

62. *Id.* at 1200 (quoting 17 U.S.C. § 1201(c)(1)).

63. *Id.* at 1201.

64. *Id.*

65. *MDY Indus., LLC v. Blizzard Ent., Inc.*, 629 F.3d 928 (9th Cir. 2010).

66. *Id.* at 935.

67. *Id.* at 936.

68. *Id.*

69. *Id.* at 941.

70. *Id.* at 941–42.

infringement was found, the court still needed to decide whether MDY violated section 1201 of the DMCA, which relied on whether they chose to follow the Federal Circuit's interpretation.

The court in *MDY* declined to adopt the Federal Circuit's interpretation because subsections 1201(a)(1) and 1201(a)(2) fail to mention traditional copyright infringement.⁷¹ Additionally, in the Ninth Circuit's view, creating a new property right under section 1201 is consistent with the legislative history of the DMCA.⁷² The court addressed the Federal Circuit's interpretation, but found the "plain language" of the statute, as well as the policy rationale of needing to protect copyright owners with digitally stored work, outweighed the language of section 1201(c)(1) and the antitrust concerns brought up by the Federal Circuit.⁷³ Under this interpretation, the court found that MDY violated section 1201(a)(2) by selling this bot which circumvented Warden.⁷⁴ It is worth noting that here: Blizzard did not have to rely solely on the DMCA's anticircumvention provisions as a legal solution; MDY's actions also violated Blizzard's terms of service, so Blizzard was also able to bring a tortious interference claim.⁷⁵

2. *Doctrinal Recommendations*

The circuit split highlights the current tension in section 1201: on one side there is the language of section 1201(c)(1) and prior copyright doctrine, which prohibits copyright protection of functionality. Section 1201(c)(1) states that "[n]othing in this section shall affect rights, remedies, limitations, or defenses to copyright infringement, including fair use, under this title," which appears to say that section 1201 does not create new property rights and that copyright infringement is necessary for liability.⁷⁶ On the other side, the legislative history understanding of section 1201(a), as well as its plain language, indicate that one could be liable for circumvention alone. The analysis in the House Report states that "(a)(1) establishes a general prohibition against gaining unauthorized access to a work by circumventing a technological protection measure put in place by the copyright owner,"⁷⁷ and section 1201(a)'s language supports that view: "[n]o person shall circumvent a technological measure that effectively controls access to a work protected under this title."⁷⁸ However, the

71. *Id.* at 945.

72. *Id.* at 947.

73. *Id.* at 949–50.

74. *Id.* at 953.

75. *Id.* at 955.

76. 17 U.S.C. § 1201(c)(1).

77. H. REP. NO. 105-551, pt. 1, at 17–18 (1998).

78. 17 U.S.C. § 1201(a)(1)(A).

legislative history also indicates that TPMs in a lawfully acquired item may not be protected by section 1201, further supporting that repairing or modifying items should not violate the DMCA.⁷⁹

Both these cases failed to adequately analyze whether unprotected functionality or copyrightable material were accessed, to determine whether section 1201 should actually apply. But, the court in *Chamberlain* still reached the correct outcome by interpreting the law to require infringement. In some ways, the facts in each case may have influenced the outcome in each circuit and explain why the Federal Circuit took on such an interpretation. The policy concerns, which led to the Federal Circuit's requirement of circumvention being used for infringement, were readily apparent in *Chamberlain*. Anticircumvention and copyright protection in garage door openers looks much more like a misuse of copyright law, while the work accessed in *MDY*, a highly creative work and a video game, fits squarely into the type of work copyright law is meant to protect. Additionally, a competitor trying to interoperate and enter the market brings up antitrust concerns that do not exist in the context of a bot helping videogame players cheat in the game. Still, the Ninth Circuit should have required some form of copyright infringement. While the Ninth Circuit likely felt the need to punish a relatively bad actor, it did not need to use the DMCA's anticircumvention provisions to do so. Blizzard also had a tortious interference of contract claim, which more appropriately addressed the bad action at hand. Using copyright law to replace other forms of liability that are not related to intellectual property undermines other areas of law, as well as the legitimacy of intellectual property protection.

Legal scholars studying both cases have noticed that the Federal Circuit largely ignored both Congress' intent and the language of section 1201(a) when writing the *Chamberlain* opinion.⁸⁰ However, the court saw that strict adherence would result in substantial policy concerns, as well as a potential

79. H. Rep. 105-551, pt. 1, at 18. The legislative history states:

Paragraph (a)(1) does not apply to the subsequent actions of a person once he or she has obtained authorized access to a copy of a work protected under Title 17, even if such actions involve circumvention of additional forms of technological protection measures. In a fact situation where the access is authorized, the traditional defenses to copyright infringement, including fair use, would be fully applicable. So, an individual would not be able to circumvent in order to gain unauthorized access to a work, but would be able to do so in order to make fair use of a work which he or she has acquired lawfully.

Id.

80. See Zingales, *supra* note 36, at 12–13.

constitutionality issue.⁸¹ Because providing a new right of access would greatly change the balance between consumers and authors, the court instead found itself “resorting to good sense” rather than following the exact language of the statute.⁸² There is, however, another way to resolve the repair/modification prohibition issue without going against the language of the statute.

Instead, courts should go back to the jurisprudence of *Baker* and *Lotus*, which both hold that making use of functionality in a copyrighted work is not infringement because the functionality itself is *not copyrightable*; thus, the DMCA does not apply to those aspects of the work.⁸³ Even for courts which hold that section 1201 violations do not require copyright infringement, this analysis will lead to an appropriate outcome, because the DMCA, like the rest of the copyright statute, can only apply to copyrighted *works*, not the functionality.⁸⁴ As such, modifications or repairs of software that are functional in nature would not trigger section 1201, even if one bypassed a digital lock to get to the code at issue.

This type of ruling is best illustrated by *Lexmark v. Static Control Components*. In *Lexmark*, a printer company, Lexmark, had an authentication sequence which allows its printers to function with its printer cartridges.⁸⁵ Static Control Components (SCC) marketed a microchip that could mimic this sequence so that consumers could use cheaper, recycled cartridges instead.⁸⁶ Lexmark then sued SCC for copyright infringement under section 106 and for violation of the anticircumvention provision of the DMCA.⁸⁷ The appeals court, however, found that the Toner Loading Program, which the lockout code was meant to protect, was likely not a copyrightable work.⁸⁸ Because the program was a method of operation, it likely could not get copyright protection, even if there were other methods of operation which could accomplish the same thing.⁸⁹ Additionally, the court rejected the DMCA claim regarding access to the Printer Engine Program for two reasons. First, the program could alternatively be accessed by reading the code in question from the printer memory after purchasing a printer.⁹⁰ Second, the technological measure largely prevented the

81. *Id.* at 14. For a full discussion of the constitutionality issue, see *supra* note 33.

82. *Id.* at 15.

83. See *supra* Section III.A.

84. 17 U.S.C. § 1201(a)(1)(A) (“No person shall circumvent a technological measure that effectively controls access to a work protected under this title.”) (emphasis added).

85. *Lexmark Int’l, Inc. v. Static Control Components, Inc.*, 387 F.3d 522, 530 (6th Cir. 2004).

86. *Id.*

87. *Id.* at 531.

88. *Id.* at 541.

89. *Id.* at 540.

90. *Id.* at 546–48.

programming from running, which was a functionality issue. Because the TPM did not protect the code itself, no DMCA claim could be brought.⁹¹

In his concurring opinion, Judge Merritt called for a broader rule. He proposed establishing in law that “companies . . . cannot use the DMCA in conjunction with copyright law to create monopolies of manufactured goods for themselves,” which might have happened in *Lexmark* if the TPM had effectively blocked access to the Printer Engine Program or if the Toner Loading Program had more creative rather than functional elements.⁹² The concurrence highlights that the burden is currently on the defendant to show that its circumvention falls under one of the exemptions, rather than on the plaintiff to show that the defendant was accessing a copyrighted work, and this could lead to more established and sophisticated companies bringing lawsuits to quash rival companies due to the initial costs of litigation.⁹³ As Judge Merritt notes, such outcomes “clearly stifle rather than promote progress.”⁹⁴ If the court had not seen that the uses by the defendant were purely functional, the court could have found a DMCA violation. This shows the likely potential for a type of aftermarket monopoly misuse that many circuit court judges fear.

Focusing on the nature of the accessed work, as well as how it is used by the circumventer, would help courts analyze whether there is a section 1201 violation. If the work is generally not copyrightable, or if the defendant was making use of functionality, section 1201 cannot apply because the TPM in either scenario does not protect an applicable work under the statute. Using such a test, as outlined in *Baker* or *Lotus*, would allow courts to reach an equitable outcome while still following section 1201 without controversy.

Unfortunately, it is unclear how this interpretation issue will be resolved by remaining circuits or how and if the Supreme Court will issue an interpretation in the near future. The Copyright Office, thus far, has interpreted the statute to align with the Ninth Circuit’s interpretation.⁹⁵ Further, the Copyright Office and most courts have failed to constrain copyright protection of largely functional works appropriately, and rulings have largely ignored the issue of whether the protected work merited copyright

91. *Id.*

92. *Id.* at 551–52 (Merritt, J., concurring).

93. *Id.* at 552.

94. *Id.* at 553.

95. See SECTION 1201, *supra* note 4, at 42–43 (“The Office does not . . . believe enacting an infringement nexus requirement to be advisable, as it would severely weaken the right of copyright owners to exercise meaningful control over the terms of access to their works online—a right . . . essential to the development of the digital marketplace for creative content.”).

protection before commencing the circumvention and access analysis.⁹⁶ Before looking at circumvention, courts need to evaluate whether what was accessed is copyrightable material. Similarly, the Copyright Office's report on section 1201 indicates that the Copyright Office believes accessing software in a device for repair would violate section 1201 if no exemption were granted, even though accessing a device's software for repair involves accessing *functionality*, rather than copyrightable material.⁹⁷ Until copyrightability is regularly addressed in section 1201 cases, another solution will likely be needed.

C. STATUTORY REVISION

Instead of relying on court decisions, Congress could revise the DMCA to clarify limitations as to when anticircumvention provisions apply. Smaller revisions, such as a permanent exemption for repair of devices, have already been suggested by the Copyright Office.⁹⁸ A permanent exemption for all non-infringing uses could clear up the circuit split confusion because, then, infringement and copyrightability analyses would always be required in the court's analysis of section 1201(a) violations.

While there has been disagreement about the necessity of infringement, a permanent statutory exemption requiring infringement would be the correct outcome to promote the policy goals of copyright law and lead to consistent case outcomes. The DMCA has, in fact, encouraged the type of aftermarket protection through copyrightable schemes that the Federal Circuit feared. For example, John Deere has software controls in its newer farm equipment, which require farmers to bring the tractors to a John Deere dealer rather than fix the tractor themselves, or otherwise risk litigation under the DMCA.⁹⁹ This action by John Deere led to the 2015 right-to-repair exemption for farm equipment.¹⁰⁰ It has since been upheld in the Seventh Triennial Rulemaking Process in 2018 and remains as a current temporary exemption.¹⁰¹ As another lesser-known example, Texas Instruments (TI) threatened calculator hobbyists with legal action after they bypassed TPMs in TI's graphing calculators to install operating systems the hobbyists had made.¹⁰² So far, courts have largely failed to evaluate whether a defendant's use was only of functionality rather than

96. *See id.* at 38–40 (discussing different interpretations of how section 1201 applies to the Internet of Things).

97. *See infra* discussion in Section IV.A and notes 140–41.

98. SECTION 1201, *supra* note 4, at 94–95.

99. PERZANOWSKI & SCHULTZ, *supra* note 1, at 144.

100. *Id.* at 144–45.

101. 37 C.F.R. 201.40(b)(9).

102. *Unintended Consequences*, *supra* note 1.

copyrighted work. Passing this type of permanent exemption would prevent violations for functional uses because such uses are non-infringing.

Misuse of anticircumvention law can (sometimes) be resolved through the triennial rulemaking process. However, not all proposed non-infringing uses will receive temporary exemptions from the Copyright Office. For example, the farm equipment exemption somewhat successfully allowed farmers to go back to repairing their own equipment, if they so choose. But, on the other hand, other petitions to create an exemption for modification or tinkering have generally not cleared the Copyright Office's requirement that *all* such uses would likely be non-infringing in order to get a temporary exemption.¹⁰³

Even for the repair petitions which have succeeded, the process still includes plenty of costs that could be avoided if an infringement requirement were implemented instead. The rulemaking process requires considerable amounts of work by attorneys and other advocates, and this burden is incredibly high for public interest organizations and other groups with limited resources.¹⁰⁴ Due to these limitations, the Copyright Office has also recommended, during its examination of section 1201, that Congress enact a permanent exemption, but only for repair.¹⁰⁵ Because modification could potentially infringe on copyright owners' rights, the Office did not recommend it be included in a permanent exemption.¹⁰⁶ The Copyright Office also declined to recommend an exemption which would permit non-infringing or fair uses.¹⁰⁷ However, an exemption permitting non-infringing uses would definitively allow those accessing software for repair or modification to be free from legal liability, because access for functionality is a non-use under copyright law.¹⁰⁸ Implementing a permanent exemption for all non-infringing or fair uses and/or interpreting section 1201(c)(1) to require that circumventers are only liable when infringing will alleviate the burden on both the Copyright Office and public interest organizations in the triennial rulemaking process.

103. See ACTING REGISTER'S RECOMMENDATION, *supra* note 16, at 207–08.

104. See SECTION 1201, *supra* note 4, at 128 (providing an example from the Cyber Law Clinic, which estimated 575 hours dedicated to the most recent rulemaking); *Libraries Again Fight for Exemptions from "Digital Locks" Copyright Law*, DISTRICT DISPATCH (Nov. 11, 2014), <https://www.districtdispatch.org/2014/11/libraries-fight-exemptions-digital-locks-copyright-law/> (describing the process as “expensive and time consuming” for library organizations).

105. SECTION 1201, *supra* note 4, at 94–95.

106. *Id.* at 97.

107. *Id.* at 102.

108. DRASSINOWER, *supra* note 45, at 98 (“Selden’s copyright cannot reach Selden’s system because authors cannot claim as inventors. *Baker* is about the distinction between copyright and patent, works and tools . . .”).

Additionally, revision or re-interpretation of the anticircumvention statute could address the potential First Amendment concerns brought in the ongoing EFF litigation that asserts that the DMCA is unconstitutional.¹⁰⁹ Requiring the plaintiff to show a relationship between the defendant's circumvention and an attempt to infringe the plaintiff's copyright would keep the DMCA in line with existing copyright law, which has not been found to restrict or substantially burden speech. Many parties which oppose the infringement requirement would likely not want the DMCA to be found unconstitutional. Depending on how this litigation continues, the Copyright Office and other parties may push for the infringement requirement interpretation, even if the statute is not revised in the near future.

IV. OTHER JUSTIFICATIONS FOR ALLOWING MODIFICATION AND REPAIR UNDER THE DMCA

As discussed in Part III, courts have found that the consumer's interest in repairing, and to some extent tinkering, outweighs the intellectual property owner's interest in a complete monopoly over the making of the patented product for the granted amount of time.¹¹⁰ Recognizing why courts have taken this position is important in understanding why right to repair advocates push so strongly for this right, with respect to section 1201. Several justifications exist, such as sustainability, incremental innovation, and increasing social good and quality of life.

A. PATENT LAW AND RIGHT TO REPAIR OR MODIFY

To better understand how section 1201 is an overreach of copyright law, it is important to know how patent law, which does protect functional innovation, regards repair or tinkering. Patent law generally allows owners of an item, which contains patented functionality, to repair or modify it if such modification is for noncommercial, personal use.¹¹¹ These allowances are given to the owner of the tangible product or item, even though they infringe on the

109. *See supra* note 33.

110. *See, e.g.,* Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336, 346 (1961); Roche Prods. v. Bolar Pharm. Co., 733 F.2d 858, 862 (Fed. Cir. 1984) (quoting *Poppenhusen v. Falke*, 19 F. Cas. 1048, 1049 (C.C.S.D.N.Y. 1861)).

111. 5 CHISUM ON PATENTS § 16.03(1) ("A line of authority indicates that a defendant who makes and uses a patented product or process does not infringe if the use is for purposes of research or experimentation and not for profit."); *id.* § 16.03(3) ("[The] right to use includes a right to make repairs on the product necessary for continued use. Repair includes the replacement of parts under certain circumstances.").

patent owner's intangible right to the innovation, through the patent.¹¹² Owners of items which contain patented functionality can repair those items, so long as those repairs do not effectively replace the product.¹¹³ This means that as long as the repairs do not require one to completely re-construct the product, there is no patent infringement.¹¹⁴ Similarly, under patent law, one can make modifications and experiment with a piece of patented technology under certain narrow restrictions. The owner of an item composed of patented innovations has some leeway, so long as the tinkering is not done for economic gain but rather for “gratifying a philosophical taste, or curiosity, or for mere amusement.”¹¹⁵

The way in which repair and modification are allowed in patent law is particularly interesting, given the Copyright Office's interpretation of the DMCA. Without an exemption, the Copyright Office would hold that circumvention, in order to repair, would violate the DMCA.¹¹⁶ Under the Copyright Office's interpretation of the anti-circumvention provisions, the functional aspects of smart appliances and smart phones get copyright protection, which lasts far longer than the protection they would have received under patent law.¹¹⁷

Offering copyright protection to software functions in these devices could greatly stifle innovation. Patents expire after twenty years, yet offer strong protection of functionality.¹¹⁸ Copyright, on the other hand, lasts considerably longer (ninety-five years) but is meant to have no protection for functional elements and only protects the original work from copying, which is a weaker protection of the creative expressions of a work than what patent law protects in functionality.¹¹⁹ Under the DMCA anticircumvention provisions, some courts and the Copyright Office have allowed functionality to get patent-level protection with the span of time granted by copyright.¹²⁰ This level of

112. *Id.* § 16.03(1) (“Mere use of a patented product or process, even for purposes of personal convenience, ordinarily constitutes infringement.”); *cf.* citations, *supra* note 111.

113. *See Aro Mfg.*, 365 U.S. at 346 (“Mere replacement of individual unpatented parts, one at a time, whether of the same part repeatedly or different parts successively, is no more than the lawful right of the owner to repair his property.”).

114. *See id.* (holding that replacement “is limited to such a true reconstruction of the entity as to ‘in fact make a new article’”).

115. *Roche Prods.*, 733 F.2d at 862 (Fed. Cir. 1984) (quoting *Poppenhusen*, 19 F. Cas. at 1049).

116. SECTION 1201, *supra* note 4, at 92–93.

117. *Id.*

118. PETER S. MENELL, MARK A. LEMLEY & ROBERT P. MERGES, *INTELLECTUAL PROPERTY IN THE NEW TECHNOLOGICAL AGE* 162–63 (2018).

119. 3 NIMMER ON COPYRIGHT § 9.11; 2 NIMMER ON COPYRIGHT § 8.01.

120. *See* SECTION 1201, *supra* note 4, at 30 (“Although the United States has consistently interpreted section 1201 as creating a cause of action separate and independent from copyright

protection for ninety-five years would be disastrous for innovation.¹²¹ Protecting functional innovation to a greater extent under copyright law than what patent law allows is incongruous with the policy goals of intellectual property law.

B. SUSTAINABILITY

One reason why allowing consumers to repair already-purchased devices is that it prevents unnecessary waste. When the owner of a device must take it to a certified repair shop anytime an issue persists, the device-seller has an effective monopoly on the repair market because the owner themselves cannot repair the device, nor can they choose an independent repair shop.¹²² At a certain price point, especially once a device or appliance is no longer under warranty, it becomes more attractive to consumers to simply buy a new version of the product and throw the damaged one into the garbage.¹²³ However, this line of action has had devastating results for the environment and as such, is a reason to favor allowing consumers to repair their own devices.¹²⁴

For example, the mobile phone manufacturing cycle has a massive annual carbon footprint (equivalent to the Philippines's entire yearly emissions), yet many consumers purchase a new phone every one to three years.¹²⁵ Using phones longer could reduce these emissions, but in order to reasonably accomplish this, consumers will need to be able to get repairs for smartphones at a fair price. Overall, a complete picture of what repair rights' impact would be on the environment has been difficult to assess due to a lack of comprehensive empirical studies.¹²⁶ However, it is generally accepted that re-

infringement, courts construing the statute to date have divided over its relationship to the traditional rights of copyright owners.”).

121. Chipman, *supra* note 20, at 1084–85 (discussing the DMCA's chilling effect on research and innovation).

122. Nicholas Deleon, *Right-to-Repair Laws Could Make It Easier to Get a Phone or Laptop Fixed*, CONSUMER REPORTS (Mar. 29, 2018), <https://www.consumerreports.org/consumer-protection/right-to-repair-laws-could-make-it-easier-to-get-a-phone-or-laptop-fixed/>.

123. Roger Harrabin, *EU Brings in 'Right to Repair' Rules for Appliances*, BBC (Oct. 1, 2019), <https://www.bbc.com/news/business-49884827>.

124. *Id.*; Catie Keck, *Right to Repair is Less Complicated and More Important Than You Might Think*, GIZMODO (May 10, 2019), <https://gizmodo.com/right-to-repair-is-less-complicated-and-more-important-1834672055> (“On top of this rigged cycle of predatory price gouging and consumer manipulation, there's another serious problem: electric waste. E-waste describes the electronic stuff that's no longer in use or no longer working The more stuff you buy, the more waste you're likely to generate.”).

125. *The Global Carbon Footprint of Mobiles*, RESTART PROJECT, <https://therestartproject.org/the-global-footprint-of-mobiles/> (last visited Feb. 17, 2020).

126. Cindy Kohtala & Sampsa Hyysalo, *Anticipated Environmental Sustainability of Personal Fabrication*, 99 J. CLEANER PRODUCTION 333, 333–34 (2015).

use and repair of digital products would improve sustainability to some extent over current consumer trends.¹²⁷ Allowing and encouraging repair is the more sustainable option, compared to granting monopolies in the repair industry through the misuse of copyright law.

C. INCREMENTAL INNOVATION

Sustainability, while a strong argument for repair, does not generally provide a justification for modification. One argument that favors modification and tinkering is that such activities will, over time, lead to further innovation and progress. Historically, many manufacturing improvements came about after the company purchasing and using the equipment found ways to make it work better for them.¹²⁸ Some have put forth arguments that today's technology is too complicated for such advancements to still occur.¹²⁹ But, it is worth examining whether that argument is actually true. It turns out that even for more complicated devices, there are still consumers that wish to modify or customize in a way that leads to innovation.

A more customized product for a small set of users is often unprofitable for most manufacturers.¹³⁰ A variety of reasons make such customization untenable. For example, the manufacturer may only specialize in certain component materials, such as carbon fiber, and is unable to accommodate changes that would use different resources.¹³¹ As another example, manufacturers of highly customized products would still need to ensure that each iteration of the product is free from defects or risk liability.¹³² In these contexts, user innovation is a natural result for those that want customization. Additionally, recent studies on user innovation in a variety of fields have shown that users on the leading edge of the technology will often make modifications and innovate.¹³³ This is because lead users will often notice what a product is lacking ahead of the rest of the users or consumers and can then make innovations that other users will also benefit from, even if such changes are relatively small.¹³⁴ In fact, the lightbulb, symbolic of sudden breakthroughs

127. *Id.*

128. ERIC VON HIPPEL, DEMOCRATIZING INNOVATION 21–22 (2005), available at <https://web.mit.edu/evhippel/www/books/DI/DemocInn.pdf>.

129. See generally Marissa MacAneny, Note, *If it is Broken, You Should Not Fix it: the Threat Fair Repair Legislation Poses to the Manufacturer and the Consumer*, 92 ST. JOHN'S L. REV. 331 (2018).

130. VON HIPPEL, *supra* note 128, at 51.

131. *Id.* at 48.

132. *Id.* at 50–51.

133. See *id.* at 23–30 (providing statistical examples of such innovation in PC-CAD users, libraries, extreme sports, and surgeons).

134. *Id.* at 22–23.

in innovation, was developed through small, incremental improvements over time.¹³⁵

In addition to the incremental innovation that can build on existing work, diagnostic and repair access to software systems could further enhance the safety of the existing software. Multiple car manufacturers have released vehicles with software flaws that lead to security risks from hackers or glitches that simply prevent the car from functioning properly.¹³⁶ Allowing consumers to bypass TPMs opens up the possibility of catching these errors with more people looking at the code.¹³⁷ TPMs have also prevented regulatory agency oversight from verifying that automobile and other types of manufacturers are complying with health, safety, and environmental laws.¹³⁸ This same concern can apply to many medical devices as well. Patients have found it immensely valuable to their quality of life to be able to modify devices, such as insulin trackers and pacemakers, to ensure that they can use the data these devices collect, and to ensure that such devices are not susceptible to security risks.¹³⁹

The types of innovation by users are likely to be small, incremental changes much of the time.¹⁴⁰ However, incremental innovation accounts for large amounts of technology progress, making it at least equally as valuable as more pioneering innovations.¹⁴¹ The potential for innovation combined with an increase in oversight for safety provides a compelling rationale for allowing users to modify or repair the products they own. However, section 1201 currently encourages the opposite.

135. See *The History of the Lightbulb*, U.S. DEP'T OF ENERGY (Nov. 22, 2013), <https://www.energy.gov/articles/history-light-bulb> (detailing the history of how the modern-day lightbulb was invented).

136. PERZANOWSKI & SCHULTZ, *supra* note 1, at 147.

137. *Id.*

138. See *id.* at 148 (providing an example of Volkswagen cheating its emissions restriction requirements through proprietary software).

139. See *id.* at 152–53; but see MacAneny, Note, *supra* note 129, at 341–42 (stating that allowing untrained parties to access and modify, or repair, medical devices will lead to a second-hand medical device market free from accountability). A second-hand market for medical devices would violate laws beyond just the DMCA, and it seems more relevant to address such a concern through healthcare law or the FDA.

140. See VON HIPPEL, *supra* note 128, at 21.

141. See William J. Abernathy & James M. Utterback, *Patterns of Industrial Innovation*, 80 TECH. REV. 40, 44, available at <https://teaching.up.edu/bus580/bps/Abernathy%20and%20Utterback,%201978.pdf> (“Though many observers emphasize new-product innovation, process and incremental innovations may have equal or even greater commercial importance.”).

D. COMMUNITY PARTICIPATION AND DEMOCRATIC THEORIES OF COPYRIGHT

Finally, one argument in favor of both repair and tinkering is that both these activities contribute to meaningful lives and enhance community building. Allowing modification and repair of functional articles is important, simply because “users like to innovate.”¹⁴² In a research study on user innovation, many user-innovators indicated that the innovation process “produce[d] learning and enjoyment that [was] of high value to them.”¹⁴³ Under Self-Determination Theory, most, if not all, people need their life to be engaging and active in order to have a satisfying life.¹⁴⁴ One such way this engagement can occur is through working and gaining expertise in certain technologies, whether as a job or as a hobby.¹⁴⁵ Particularly when modification occurs as a hobby, communities around the hobby result, allowing people to engage meaningfully with others who share a similar interest.¹⁴⁶ While this is not the only pathway to community building and decreasing isolation, it makes sense for law to help rather than hinder these types of outcomes.¹⁴⁷

This community building can have impacts beyond improving one individual’s quality of life. While one user may come up with a few incremental changes, the aggregate of their entire interest communities’ changes can both greatly increase the magnitude of innovation and the dissemination of those improvements.¹⁴⁸ Additionally, allowing people to modify mass-produced goods can help promote distributive justice by decentralizing innovation.¹⁴⁹

Furthermore, allowing consumers to tinker will not necessarily cause the economic harm that manufacturers fear. Many new products fail, and one rather large contributing factor to that failure is manufacturers’

142. William W. Fisher III, *The Implications for Law of User Innovation*, 94 MINN. L. REV. 1417, 1457 (2010).

143. VON HIPPEL, *supra* note 128, at 60.

144. Fisher, *supra* note 142, at 1469.

145. *Id.* (“When done at work, innovation helps make that work “meaningful” (in the Marxist sense); the innovator takes control of the tools of her trade and adapts them in hopes of doing the job better. When done outside of work, it makes for more active play.”).

146. *Id.* at 1470.

147. *Id.* at 1471–72 (“The activity of modifying mass-produced products is plainly not the only way in which one can live a good life”) (“[But if] the principal responsibility of the state is to create conditions that provide people access to rewarding lives, then . . . we ought to adjust the legal system to increase the ability of people to engage in [these] activities”).

148. VON HIPPEL, *supra* note 128, at 96. For examples of this type of community innovation, see *id.* at 97–104.

149. See *id.*; Fisher, *supra* note 142, at 1458–59; see also *id.* at 1462 (describing the failure of a green energy project from large manufacturers that then resulted in the successful development of “biomass charcoal” by the local community).

misunderstanding of what users want and look for in a product.¹⁵⁰ Allowing users to incorporate their own innovations into the products they purchased will both accommodate this failure in understanding what consumers are looking for and will attract new consumers who will “pay more for products with which they are permitted and able to tinker.”¹⁵¹

All of these policy goals (sustainability, incremental innovation, and community participation) drive the decisions judges made in patent law to permit repair and personal-use tinkering.¹⁵² However, the DMCA has not promoted these policy norms.

V. CONCLUSION

In all copyright cases, including alleged DMCA section 1201 violations, it is important to consider whether or not copyright infringement occurred; using functionality of a product you own should not implicate copyright liability. The anticircumvention provisions of the DMCA have made copyright more secure in the digital age, but they have also had the unintended effect of extending the scope of copyright beyond incentivizing the creation of original works. Instead, the prohibition on circumvention has hindered further innovation and creativity in industries which make use of software within functional items. These anticircumvention provisions in practice have allowed manufacturers of functional works to protect functionality and get patent-like monopolies for more than triple the amount of time that the patent system would grant.

Section 1201’s protections should not extend to the functional elements of these works because the functional elements are not in fact copyrightable material. Better recognition of the purpose of circumvention could prevent the excessive amounts of protection for functionality described above. Requiring copyright infringement in these types of cases is one way to reach outcomes which protect tinkerers and repairers. Another option is to evaluate whether the circumventer used only functional elements of the work instead of any of the copyrightable expressions, because access to works without copyright protection is allowed under section 1201.

Overall, a permanent exemption for all non-infringing uses, including fair use, would best align with the scope of copyright protection that both protects authors and also encourages others to build on that creativity or innovation. It would help courts reach consistent outcomes in section 1201 cases, and it

150. VON HIPPEL, *supra* note 128, at 107–08.

151. Fisher, *supra* note 142, at 1457.

152. *See, e.g.,* Aro Mfg. Co. v. Convertible Top Replacement Co., 365 U.S. 336 (1961).

would resolve the current circuit split. Allowing non-infringing uses to encourage repair and modification will both help people live a more fulfilling life and likely improve everyone's lives by furthering innovation and device safety.

