

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

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**AMERICAN AXLE & MANUFACTURING, INC.,**  
*Plaintiff-Appellant*

v.

**NEAPCO HOLDINGS LLC, NEAPCO DRIVELINES  
LLC,**  
*Defendants-Appellees*

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2018-1763

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Appeal from the United States District Court for the District of Delaware in No. 1:15-cv-01168-LPS, Chief Judge Leonard P. Stark.

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**ON PETITION FOR REHEARING EN BANC**

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JAMES RICHARD NUTTALL, Steptoe & Johnson, LLP, Chicago, IL, filed a combined petition for panel rehearing and rehearing en banc for plaintiff-appellant. Also represented by JOHN LLOYD ABRAMIC, KATHERINE H. JOHNSON, ROBERT KAPPERS; CHRISTOPHER ALAN SUAREZ, Washington, DC.

J. MICHAEL HUGET, Honigman LLP, Ann Arbor, MI, filed a response to the petition for defendants-appellees. Also represented by SARAH E. WAIDELICH; DENNIS J. ABDELNOUR, Chicago, IL.

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MATTHEW ZAPADKA, Bass, Berry & Sims, PLC, Washington, DC, for amici curiae Jonathan Barnett, Richard A. Epstein, Christopher Michael Holman, Daryl Lim, Adam Mossoff, Kristen J. Osenga, Michael Risch, Ted M. Sichelman, Brenda M. Simon, Jonathan Stroud, David O. Taylor, Saurabh Vishnubhakat. Also represented by SCOTT A. M. CHAMBERS, Porzio, Bromberg & Newman, PC, Washington, DC.

MARK J. ABATE, Goodwin Procter LLP, New York, NY, for amicus curiae Intellectual Property Owners Association. Also represented by ALEXANDRA D. VALENTI; HENRY S. HADAD, Bristol-Myers Squibb Company, Princeton, NJ; KEVIN H. RHODES, 3M Innovative Properties Company, St. Paul, MN.

JEREMY COOPER DOERRE, Tillman Wright PLLC, Charlotte, NC, as amicus curiae, pro se.

AARON BARKOFF, McAndrews, Held & Malloy, Ltd., Chicago, IL, for amicus curiae Biotechnology Innovation Organization. Also represented by CHRISTOPHER SINGER; MELISSA A. BRAND, HANSJORG SAUER, Biotechnology Innovation Organization, Washington, DC.

ROBERT P. TAYLOR, Rpt Legal Strategies PC, San Francisco, CA, for amicus curiae Alliance of U.S. Startups and Inventors for Jobs.

JOHN THOMAS BATTAGLIA, Alexandria, VA, for amicus curiae Paul R. Michel.

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Before PROST, *Chief Judge*, NEWMAN, LOURIE, DYK,  
MOORE, O'MALLEY, REYNA, WALLACH, TARANTO, CHEN,  
HUGHES, and STOLL, *Circuit Judges*.

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DYK, *Circuit Judge*, with whom WALLACH and TARANTO, *Circuit Judges*, join, concurs in the denial of the petition for rehearing en banc.

CHEN, *Circuit Judge*, with whom WALLACH, *Circuit Judge*, joins, concurs in the denial of the petition for rehearing en banc.

NEWMAN, *Circuit Judge*, with whom MOORE, O'MALLEY, REYNA, and STOLL, *Circuit Judges*, join, dissents from the denial of the petition for rehearing en banc.

STOLL, *Circuit Judge*, with whom NEWMAN, MOORE, O'MALLEY, and REYNA, *Circuit Judges*, join, dissents from the denial of the petition for rehearing en banc.

O'MALLEY, *Circuit Judge*, with whom NEWMAN, MOORE, and STOLL, *Circuit Judges*, join, dissents from the denial of the petition for rehearing en banc.

LOURIE, *Circuit Judge*, dissents without opinion from the denial of the petition for rehearing en banc.

PER CURIAM.

### **O R D E R**

Appellant American Axle & Manufacturing, Inc. filed a combined petition for panel rehearing and rehearing en banc. A response to the petition was invited by the court and filed by appellees Neapco Holdings LLC and Neapco Drivelines LLC. Several motions for leave to file amici curiae briefs were filed and granted by the court. The petition for rehearing, response, and amici curiae briefs were first referred to the panel that heard the appeal, which granted the petition in part as indicated in the accompanying order. Thereafter, the petition was referred to the circuit judges who are in regular active service. A poll was requested, taken, and failed.

Upon consideration thereof,

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IT IS ORDERED THAT:

- 1) The petition for rehearing en banc is denied.
- 2) The mandate of the court will issue on September 8, 2020.

FOR THE COURT

July 31, 2020  
Date

/s/ Peter R. Marksteiner  
Peter R. Marksteiner  
Clerk of Court

**United States Court of Appeals  
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Appeal from the United States District Court for the District of Delaware in No. 1:15-cv-01168-LPS, Chief Judge Leonard P. Stark.

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DYK, *Circuit Judge*, with whom WALLACH and TARANTO, *Circuit Judges*, join, concurring in the denial of the petition for rehearing en banc.

We agree that en banc review was not warranted. The panel opinion is both consistent with precedent and narrow in its scope. Claim 22 and related claims instruct only the use of mass and stiffness to match relevant frequencies to tune a propshaft liner so that the liner, when used, will produce certain results (reducing two modes of vibration from the propshaft). Contrary to Judge Stoll's dissent, these claims in no way "recite the process and machinery necessary to produce the desired effect of reducing vibrations in a shaft assembly." Stoll Dissent Op. at 2–3.

Because claim 22 contains no further identification of specific means for achieving those results, but merely invokes the natural law that defines the relation between stiffness, mass, and vibration frequency, it is ineligible under a long line of cases beginning at about the time of *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853), which held ineligible a claim to “printing intelligible characters . . . at any distances” by the use of “electro-magnetism,” precisely because, unlike the other upheld claims in *O'Reilly*, it lacked any identification of specific means to use electromagnetism.<sup>1</sup> *Id.* at 113–20.

“Morse’s eighth claim would have covered, among other things, telephone, radio, television, microwave, wireless, and Internet communication, although they were all invented by others much later.” Jay Dratler, Jr., *Alice in Wonderland Meets the U.S. Patent System*, 38 Akron L.

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<sup>1</sup> Judge Stoll’s dissent suggests that “several of Samuel Morse’s other claims [in *O'Reilly*] were held eligible in that very same case, and [that] they more closely resemble the claims at issue here.” Stoll Dissent Op. at 2. Unlike claim 8, however, the other claims in *O'Reilly* all incorporated by express reference descriptions and illustrations from the specification of the patent addressed by the Court. The specification contained a number of detailed technical drawings and corresponding descriptions. See Reissue Patent No. 117 (issued June 13, 1848) (Figure 1–5 and pages 2–3). In contrast, claim 8 of *O'Reilly* specifically did not limit itself to the specification and for that reason was found ineligible. *O'Reilly*, 56 U.S. at 62 (“Eighth. I do not propose to limit myself to the specific machinery, or parts of machinery, described in the foregoing specification . . .”). In the Telephone Cases, the Supreme Court explained that *O'Reilly*’s singling out of claim 8 rested on this exact distinction. *Dolbear v. Am. Bell Tel. Co.*, 126 U.S. 1, 534 (1888).

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Rev. 299, 321 (2015). Allowing the patentability of such broad claims impairs rather than promotes innovation and denies patent protection to real inventors—those who discover particular ways to achieve the desired result. “[T]here is a danger that the grant of patents that tie up the[] use [of laws of nature] will inhibit future innovation premised upon them, a danger that becomes acute when a patented process amounts to no more than an instruction to ‘apply the natural law,’ or otherwise forecloses more future invention than the underlying discovery could reasonably justify.” *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 86 (2012).

The inventors here may well have invented a specific means of achieving the claimed result, but they chose not to include such means in the claims we hold ineligible. Those claims, which invoke only a natural law, are ineligible under *O’Reilly* and other cases invalidating claims that merely state a result without providing specific detail as to the “how”—the means for achieving the result. *See Mayo*, 566 U.S. at 71–73 (“[T]o transform an unpatentable law of nature into a patent-eligible application of such a law, one must do more than simply state the law of nature while adding the words ‘apply it.’”); *Parker v. Flook*, 437 U.S. 584, 586 (1978) (invalidating a claimed method that did not “purport to explain how to select . . . any of the . . . variables” involved, or “purport to contain any disclosure relating to the chemical process at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system”); *Mackay Radio & Telegraph Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94–101 (1939); *O’Reilly*, 56 U.S. at 112–17 (holding a claim for “use of the motive power of the electric or galvanic current . . . for marking or printing intelligible characters . . . at any distances” ineligible because “it matter[ed] not by what process or machinery the result [wa]s [to be] accomplished”); *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1852) (holding that claiming a concept without the particular steps of

carrying it out “would prohibit all other persons from making the same thing by any means whatsoever,” and that such claims are ineligible for patentability); *Corning v. Burden*, 56 U.S. (15 How.) 252, 268 (1853) (“It is for the discovery or invention of some practicable method or means of producing a beneficial result or effect, that a patent is granted, and not for the result or effect itself.”), quoted by *Diamond v. Diehr*, 450 U.S. 175, 182 n.7 (1981).<sup>2</sup>

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<sup>2</sup> See also *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167 (Fed. Cir. 2018) (holding that as “reflected repeatedly in our cases,” to avoid ineligibility, a claim must “ha[ve] the specificity required to transform [the] claim from one claiming only a result to one claiming a way of achieving it”); *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1258 (Fed. Cir. 2016) (claim was directed to an ineligible abstract idea because “[t]here [wa]s nothing in the claim that [wa]s directed to how to implement out-of-region broadcasting on a cellular telephone”); *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016) (claims found ineligible and “directed to an abstract idea” because they “d[id] not claim a particular way of programming or designing the software to create menus . . . , but instead merely claim[ed] the resulting systems”); *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1348 (Fed. Cir. 2015) (finding claim abstract because it “contain[ed] no restriction on how the result [wa]s accomplished”); *Secured Mail Sols. LLC v. Universal Wilde, Inc.*, 873 F.3d 905, 911 (Fed. Cir. 2017) (finding claims abstract because they were “not limited by rules or steps that establish[ed] how the focus of the methods [wa]s achieved”); *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 770 (Fed. Cir. 2019), *cert. denied*, 140 S. Ct. 983 (2020) (finding claims directed to abstract idea where broad claim language “would cover any mechanism for

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implementing network communication on a charging station” rather than a specific way of doing so); *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1345–46 (Fed. Cir. 2018) (claims ineligible “because they consist[ed] of generic and conventional information acquisition and organization steps that [we]re connected to, but d[id] not convert, the abstract idea . . . into a particular conception of how to carry out that concept” (emphasis added)); *Innovation Sci., LLC v. Amazon.com, Inc.*, 778 F. App’x 859, 863 (Fed. Cir. 2019) (finding ineligible a claim reciting coverage “in merely functional, result-oriented terms”); *Univ. of Fla. Research Found., Inc. v. Gen. Elec. Co.*, 916 F.3d 1363, 1364, 1368 (Fed. Cir. 2019) (claims “directed to an abstract idea” where “[n]either the . . . patent, nor its claims, explain[ed] how the drivers d[id] the conversion that [Appellant] points to.”); *Two-Way Media Ltd. v. Comcast Cable Commc’ns, LLC*, 874 F.3d 1329, 1337 (Fed. Cir. 2017) (claim directed to ineligible abstract idea where “[t]he claim require[d] the functional results of ‘converting,’ ‘routing,’ ‘controlling,’ ‘monitoring,’ and ‘accumulating records,’ but d[id] not sufficiently describe how to achieve these results in a non-abstract way”); *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018) (“*Apple, Affinity Labs*, and other similar cases hearken back to a foundational patent law principle: that a result, even an innovative result, is not itself patentable.”); *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1314 (Fed. Cir. 2016) (“[In section 101 analysis w]e . . . look to whether the claims . . . focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.”).

As the foregoing cases illustrate, the same concern is significant under the abstract idea branch of ineligibility analysis, which we leave for consideration as to the claims that are the subject of our remand.

The assertions that the panel decision holds that “any reliance on a scientific principle in the claimed subject matter affects eligibility” or calls into question the patentability of basic inventions such as “the telegraph, telephone, light bulb, and airplane” are quite incorrect. Newman Dissent Op. at 5; Stoll Dissent Op. at 7. What the decision calls into question is claims, such as claim 8 in *O’Reilly*, that claim only a result (the telegraph, electric light bulb, the combustion engine) and disclose nothing more than a natural law (electromagnetic force, incandescence, chemical combustion) to achieve that result. Nothing in the panel opinion suggests that claims that describe how the objective (light bulb, etc.) is to be achieved are patent ineligible. Such claims have long been held patentable. Such claims continue to be patentable. A contrary result would deny a true inventor (an individual who determined a specific means to achieve the claimed result) the fruits of his or her invention.

Contrary to Judge Stoll’s dissent from denial of rehearing en banc, *see* Stoll Dissent Op. at 6–7, there is also no fact issue here. If the suggestion is that it is a factual question whether more than Hooke’s Law might be needed to make a device that actually produces the claimed result, that is not the proper eligibility question. In *O’Reilly*, it was plain from the specification and the other claims that more than electromagnetism was needed to produce the claimed result, but the Supreme Court held claim 8 ineligible precisely because it omitted any such implementation means. The omission of needed specifics in the claim was the problem, not a reason to find eligibility.

The step-one “directed to” inquiry in this case, as in *O’Reilly*, is what the claim says. As to that question, the panel does not suggest that there can never be a factual issue, but there is no such factual issue here. Both parties’ witnesses agreed that Hooke’s law relates an object’s frequency of vibration to its mass and stiffness, *see* Maj. Op., slip op. at 12–13, and neither party disputes the claim

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construction given to the claim language “tuning a mass and a stiffness of at least one liner,” namely, “controlling a mass and stiffness of at least one liner to configure the liner to match a relevant frequency or frequencies,” J.A. 15, 1047. Nor is there a conflict in evidence about what “mass” or “stiffness” means to the relevant skilled artisan. The claim language thus invokes the very relation between frequency and mass and stiffness stated by Hooke’s law, as the district court determined. J.A. 11 (“The claimed methods are applications of Hooke’s law with the result of friction damping.” (emphasis added)).

Claim 22 does not name Hooke’s law, but the name is immaterial. The Supreme Court has not required reciting the natural law by name and has rejected a “draftsman’s art” approach to § 101 analysis. *See, e.g., Mayo*, 566 U.S. at 72, 77 (explaining that the “laws of nature” set forth in the claims are unnamed “relationships between concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm”).

Judge O’Malley’s dissent suggests that the panel majority “decide[s] questions on grounds that were neither argued before the district court nor briefed on appeal” and that it “announces a new test for patentable subject matter at the eleventh hour and without adequate briefing.” O’Malley Dissent at 2. But there is no new ground here. Both in district court and on appeal, Neapco Holdings LLC and Neapco Drivelines LLC (collectively, “Neapco”) argued that the claims invoked a natural law, and nothing more, to accomplish a desired result. Neapco argued in summary judgment briefings that “the claims are ineligible because they are directed to laws of nature and/or natural phenomena related to controlling the natural frequency of an object and the physics behind vibration attenuation.” J.A. 4596. Neapco’s expert stated that “the asserted claims of the ’911 patent do nothing more than attempt to claim well-known laws of nature or natural phenomen[a].” J.A. 2704.

American Axle & Manufacturing, Inc. (“AAM”) opposed this characterization of the claims in its briefing to the district court: “Neapco oversimplifie[d] the Asserted Claims to allege that they ‘do nothing more than attempt to claim well-known laws of nature or natural phenomenon . . . . [Its] arguments are without merit.” J.A. 4331 (quoting Neapco’s expert’s testimony). Ultimately, the district court found that the claims “are directed to the mere application of Hooke’s law, and they fail to instruct how to design the tuned liners or manufacture the driveline system to attenuate vibrations.” J.A. 11–12. On appeal, Neapco reiterated that “[o]ther than providing the relationship set by the natural law itself, the claims tell those of skill nothing else about how to purportedly ‘tune’ a liner.” Neapco Br. 25; *see also id.* at 38 (“[T]he claims here specifically lack[] any instruction or disclosure for how to design or manufacture the tuned liners to attenuate vibration (other than telling an engineer to ‘apply’ Hooke’s law.)”); Oral Arg. 13:38–56 (explaining that the invention “is a claim to a goal, the result . . . of tuning a liner to dampen two different modes of vibration”).<sup>3</sup> The panel opinion appropriately addresses the case as argued.

There is also no “new test” in stating that claim 22 is “nothing more” than a natural law, *i.e.*, that it contains no information as to how to achieve the claimed result. This linguistic formulation has previously been used by this

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<sup>3</sup> AAM argued that “[t]he district court [in its § 101 analysis] . . . applied an erroneous legal standard finding that the asserted claims did not ‘disclose’ or ‘instruct how’ to design tuned liners. There is no such standard, even under § 112, requiring the claims of the ’911 patent to ‘instruct how to design the tuned liners or manufacture the driveline system to attenuate vibrations.” AAM Op. Br. 54 (quoting J.A. 11).

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court in describing the test for § 101.<sup>4</sup> This “nothing more” formulation was also repeatedly used by Neapco,<sup>5</sup> by Neapco’s expert,<sup>6</sup> and by AAM to describe Neapco’s position.<sup>7</sup> The same linguistic formulation was used by the

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<sup>4</sup> See, e.g., *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1048 (Fed. Cir. 2016) (“In recent cases, we found claims ‘directed to’ a patent-ineligible concept when they amounted to nothing more than observing or identifying the ineligible concept itself.” (emphasis added)); *ChargePoint*, 920 F.3d at 769 (finding ineligible at step 1 “claims that claim nothing more than the broad law . . . underlying the claims” (emphasis added)); *Genetic Veterinary Scis., Inc. v. LABOKLIN GmbH & Co. KG*, 933 F.3d 1302, 1318 (Fed. Cir. 2019) (finding ineligible claims “directed to nothing more than ‘observing or identifying’ the natural phenomenon of a mutation in the SUV39H2 gene” (emphasis added)).

<sup>5</sup> Neapco Br. 12 (“The claimed ‘tuning’ is nothing more than a recitation of Hooke’s law . . . .” (emphasis added) (capitalization removed)); *id.* at 21 (“[T]he asserted claims do nothing more than recite the abstract concept of ‘tuning’ a liner according to a natural law.” (emphasis added)); *id.* at 32 (“The asserted claims ‘fail to provide any meaningful limits on the scope of the claim,’ and are thus ‘nothing more than applying a law of nature to a conventional method to achieve an abstract solution to a problem.” (emphasis added) (quoting J.A. 18)).

<sup>6</sup> J.A. 2704 (Neapco’s expert stating that “the asserted claims of the ’911 patent do nothing more than attempt to claim well-known laws of nature or natural phenomenon[a]” (emphasis added)).

<sup>7</sup> J.A. 4331 (AAM arguing that “Neapco oversimplifie[d] the Asserted Claims to allege that they ‘do nothing more than attempt to claim well-known laws of nature or natural phenomenon . . . . [Its] arguments are without merit.” (emphasis added) (quoting Neapco’s expert)).

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district court. J.A. 15 (“Since Hooke’s law governs the relationship between mass, stiffness, and frequency, the ‘tuning’ claim limitation does nothing more than suggest that a noise, vibration, and harshness . . . engineer . . . [would] consider that law of nature when designing propshaft liners to attenuate driveline vibrations.” (emphasis added)); J.A. 18 (“Here, because the Asserted Claims are nothing more than applying a law of nature to a conventional method to achieve an abstract solution to a problem, the Asserted Claims fail to provide any meaningful limits on the scope of the claim.”).

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CHEN, *Circuit Judge*, with whom WALLACH, *Circuit Judge*, joins, concurring in the denial of the petition for rehearing en banc.

I concur in the court's decision not to rehear this case en banc because the principles applied by the district court and panel majority in holding claim 22 invalid are consistent with long-standing precedent. Contrary to the dissent's view, the panel majority did not announce a new patent-eligibility test. Rather, its rationale is a straightforward application of the Supreme Court's decision in *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1853). Moreover, the district court applied the same test as the panel

majority and for that reason no remand is required as to claim 22.

What the dissent dubs the new “nothing more” test is actually a principle that has been part of patent law since at least 1853: a claim may be held ineligible if it invokes a natural law to achieve some desired result without reciting any further limitations as to the means for accomplishing that result. In *O’Reilly*, the Supreme Court ruled that Samuel Morse’s eighth claim, reciting nothing more than the use of electromagnetism to generate and send messages at a distance, was ineligible. *Id.* at 112–13. Today’s panel decision tracks that precise reasoning. As construed, claim 22 calls for nothing more than the use of Hooke’s law to produce a particular result: the reduction of two types of vibration in a liner. The claim is devoid of any other element for producing that result. Because claim 22, as drafted and construed, is substantively the same as Mr. Morse’s claim 8, I do not see a way to logically distinguish *O’Reilly* in this case.

Some amici suggest that the panel’s understanding of *O’Reilly* is undercut because other claims of Mr. Morse’s patent were found eligible and are analogous to AAM’s claims. *See* Law Prof. Br. 6–8. They suggest that Mr. Morse’s upheld claims merely begin with a natural law and end with a desired result without reciting any further requirements. To the contrary, each of Mr. Morse’s claims, with the exception of ineligible claim 8, limits itself to the specific implementation details disclosed in Mr. Morse’s specification. Take claim 1 for example:

Having thus fully described my invention, I wish it to be understood that I do not claim the use of the galvanic current or current of electricity for the purpose of telegraphic communications generally; but [w]hat I specially claim as my invention and improvement is—

1. Making use of the motive power of magnetism when developed by the action of such current or currents, *substantially as set forth in the foregoing description of the first principal part of my invention*, as means of operating or giving motion to machinery which may be used to imprint signals upon paper or other suitable material, or to produce sounds in any desired manner for the purpose of telegraphic communication at any distances.

U.S. Reissue Patent No. 117 (issued June 13, 1848) (emphasis added). Claim 1 does not simply invoke “the motive power of magnetism” to produce the desired result of “telegraphic communication at any distances,” but instead further confines the claim’s scope to the application of current “substantially as set forth in the foregoing description of the first principal part of [Mr. Morse’s] invention” to achieve the desired result. *Id.* The remaining claims likewise incorporate implementation details from Mr. Morse’s specification. *Id.* (claiming what was “substantially as set forth in the foregoing description,” the “combination of machinery herein described,” “substantially by the means herein described,” “substantially as herein set forth and illustrated,” and “as herein described”).

In contrast, Mr. Morse’s claim 8 disavows any implementation details from his specification:

8. *I do not propose to limit myself to the specific machinery or parts of machinery described in the foregoing specifications and claims*, the essence of my invention being the use of the motive power of the electric or galvanic current, which I call “*electromagnetism*,” *however developed*, for marking or printing intelligible characters, signs, or letters at any distances, being a new application of that power of which I claim to be the first inventor or discoverer.

*Id.* (emphasis added). As the Supreme Court later explained in *Dolbear v. Am. Bell Tel. Co.*, the distinguishing feature of Mr. Morse’s invalidated claim 8 was that it claimed “the use of magnetism as a motive power, without regard to the particular process with which it was connected in the patent.” 126 U.S. 1, 534 (1888). In contrast, the Court explained that Mr. Morse’s claim 1, although also “making use of the motive power of magnetism,” was patent eligible because that claim specified the use of magnetism in connection with the particular process disclosed in the patent. *Id.* Following these principles, the Court in *Dolbear* held eligible a claim to “transmitting vocal or other sounds telegraphically, *as herein described*, by causing electrical undulations, similar in form to the vibrations of the air accompanying the said vocal or other sound, *substantially as set forth.*” *Id.* at 532 (emphasis added).

The amici’s understanding of Mr. Morse’s upheld claims as merely reciting the motive power of magnetism to produce telegraphic communication thus suffers from multiple grave problems. First, it ignores the claim language incorporating implementation details from the specification. Second, if the amici’s reading were correct, it would render the *O’Reilly* decision hopelessly in conflict with itself, given that the Court invalidated claim 8. Third, the Court in *Dolbear*, in reiterating the principle that invoking a law of nature to achieve a result, without more, is not a patent-eligible claim, characterized Mr. Morse’s upheld claims in a way that is clearly incompatible with the amici’s views. Thus, nothing in *O’Reilly* helps AAM’s cause in this case.

Contrary to the dissent’s position that a remand is needed to allow the district court to apply the *O’Reilly* test in the first instance, the district court here already applied the principles of *O’Reilly* in the same way and based on the same claim interpretation as the panel majority when it held claim 22 invalid as merely invoking Hooke’s law to accomplish a desired result. The district court’s decision

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noted that “Neapco asserts, in order to ‘tune’ the liner, one merely applies Hooke’s law and then measures the amount of damping.” J.A. 11. “[A]gree[ing] with Neapco,” the district court explained that “[t]he claimed methods are *applications of Hooke’s law* with the result of friction damping.” *Id.* (emphasis added); *see also* J.A. 11–12 (finding the asserted claims “are directed to the *mere application of Hooke’s law*, and they fail to instruct *how* to design the tuned liners or manufacture the driveline system to attenuate vibrations.”) (first emphasis added); J.A. 15 (finding, under the court’s claim construction “controlling a mass and stiffness of at least one liner to configure the liner to match a frequency or frequencies,” that “this claim limitation is just the *application of Hooke’s law*”) (emphasis added); J.A. 17 (“Here, the Asserted Claims *simply instruct one to apply Hooke’s law* to achieve the desired result of attenuating certain vibration modes and frequencies. They provide no particular means of how to craft the liner and propshaft in order to do so.”) (emphasis added). Thus, while the district court initially identified the issue in the case as whether the asserted claims are directed to both “Hooke’s law and friction damping,” J.A. 10, the court ultimately concluded that claim 22 invokes Hooke’s law, with nothing more, to achieve a desired result. J.A. 11, 11–12, 15, 17. Notably, this understanding of the claims directly follows from the undisputed claim construction that the claim calls for controlling mass and stiffness to control frequency. *See* J.A. 10–12 (analyzing why controlling mass and stiffness to control frequency is a reference to applying Hooke’s law). And given that the district court analyzed the content of the claim and found nothing other than this reference to Hooke’s law for accomplishing the claimed results of attenuating shell mode and bending mode vibrations, its reasoning and conclusion as to claim 22’s invalidity follows the principle established by the Supreme Court in *O’Reilly*. The district court’s understanding of the claim and its rationale for holding claim 22 patent

ineligible thus are identical to the panel majority's analysis and a remand is not necessary.

While some question the correctness of the panel majority and district court's application of the *O'Reilly* test to AAM's claim 22, the application of law to fact in the section 101 context has always been a case by case judgment. Such context-driven analysis is made in many areas of patent law, for example in determining whether a claim is invalid for obviousness or construing a claim limitation in light of the specification. The same is true for the judicial exceptions to section 101 and the legal assessment as to whether a claim is directed to a patent-ineligible concept or a patent-eligible application of that concept. As Judge Learned Hand famously remarked about the similarly difficult problem in copyright law of distinguishing between idea and expression: "Nobody has ever been able to fix that boundary, and nobody ever can." *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir. 1930). In the present case, given (1) the claim language of tuning the liner's mass and stiffness, (2) the undisputed construction of the relevant claim language as referring to tuning said mass and stiffness to match frequencies, (3) the undisputed mathematical relationship, per Hooke's law, between mass, stiffness, and frequency, and (4) the district court's analysis rejecting AAM's arguments that claim 22, as construed, is not referring to Hooke's law (J.A. 11–12), it seems reasonable to me for the panel majority to view claim 22 as on par with Mr. Morse's claim 8 and thus likewise fall on the side of ineligibility.

Importantly, the majority's opinion in this case does not, and should not be read to, announce a new test for patent eligibility. It holds that the *O'Reilly* test remains good law and applies when a claim recites a limitation that, as construed, expressly invokes a particular law of nature. Maj. at 26. The majority opinion emphasizes that its holding "should not be read as an invitation to raise a validity challenge against any patent claim that requires the

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application of an unstated natural law.” *Id.* That a claim implicitly or inherently requires compliance with a natural law for any embodiment to be operational is not a basis for concluding that the claim expressly invokes that natural law. In this case, the undisputed construction of claim 22 tunes mass and stiffness to match frequency, which is the very formula for Hooke’s law.

The narrow scope of the majority’s holding is illustrated by the differences in the outcomes between claims 1 and 22. If claim 22 had omitted any reference to mass and stiffness, such that the claim simply recited “tuning to match the relevant frequency or frequencies,” there would be no basis to say that the claim invokes Hooke’s law. This is the scenario of claim 1, which recites “tuning at least one liner to attenuate at least two types of vibration transmitted through the shaft member” and “positioning the at least one liner within the shaft member such that the at least one liner is configured to damp shell mode vibrations in the shaft member by an amount that is greater than or equal to about 2%, and the at least one liner is also configured to damp bending mode vibrations in the shaft member, the at least one liner being tuned to within about  $\pm 20\%$  of a bending mode natural frequency of the shaft assembly as installed in the driveline system.” U.S. Patent No. 7,774,911 at claim 1. Because claim 1 nowhere mentions “mass” and “stiffness,” it cannot properly be read to expressly invoke the Hooke’s law relationship between mass, stiffness, and frequency. As the specification confirms, tuning for a desired frequency can be accomplished through variables other than mass and stiffness. *Id.* at col. 7 l. 60–col. 8 l. 2. Thus, unlike claim 22, claim 1 cannot be said to expressly call for Hooke’s law.<sup>1</sup> Because of the differences between

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<sup>1</sup> This distinction between claim 22, which expressly invokes Hooke’s law, and claim 1, which is entirely silent as to mass and stiffness, exists regardless of whether

the two claims, I cannot say it was wrong for the panel majority to hold that the district court erred by treating the two claims in the same way. As evidenced by the majority opinion's conclusion that claim 1 is not directed to a natural law, the narrow holding of this case should not be read to open the door to eligibility challenges based on the argument that a claim is directed to one or more unspecified natural laws.

To the extent AAM and amici contend that mechanical or industrial inventions can be categorically excluded from the ambit of section 101 concerns, I cannot agree. The origins of the judicial exceptions to patent eligibility arise from such cases during the Industrial Revolution. Mr. Morse's patent claimed the invention of the electro-magnetic telegraph. *O'Reilly*, 56 U.S. at 77. In *Wyeth v. Stone*, Justice Story, riding circuit, considered the eligibility of a patent that described a particular apparatus for cutting ice, and a method for using the inventor's apparatus to cut ice. 30 F. Cas. 723 (C.C.D. Mass. 1840) (finding ineligible a claim to "the art of cutting ice by means of any power, other than human power"). Likewise, in *Tilghman v. Proctor*, the Court evaluated the eligibility of a claim to "the manufacturing of fat acids and glycerine from fatty bodies by the action of water at a high temperature and pressure." 102 U.S. 707, 729 (1880). To exclude manufacturing methods such as AAM's from the section 101 inquiry would be inconsistent with longstanding Supreme Court precedent dating back to the origins of the eligibility inquiry.

I also do not agree with the dissent's assertion that the panel majority's decision creates a heightened enablement provision. As the majority opinion explains, section 101

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"positioning" in claim 1 is construed to have the same, or different meaning to "inserting" in claim 22. While claim 1 is not directed to Hooke's law, the district court will address on remand whether it is directed to an abstract idea.

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imposes a threshold constraint on the claims, whereas enablement applies a second, different requirement to the specification's support of those claims. Maj. at 27–29. Moreover, the panel opinion goes no farther than what is required by *O'Reilly*, which the Supreme Court has repeatedly identified as a case about the judicial exceptions to section 101. See *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1343 (Fed. Cir. 2018) (citing Supreme Court section 101 opinions discussing *O'Reilly*). And as made clear by the lengthy list of both Supreme Court and Federal Circuit cases cited in Judge Dyk's concurrence, result-oriented claim drafting raises concerns under section 101 independent from section 112. Dyk Concurrence Op. at 3–4 and n.2. The lesson to patent drafters should now be clear: while not all functional claiming is the same, simply reciting a functional result at the point of novelty poses serious risks under section 101. See, e.g., *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167 (Fed. Cir. 2018) (stressing that, as “reflected repeatedly in our cases,” a claimed invention must embody a concrete solution to a problem having “the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it”); *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175 (1853) (“A patent is not good for an effect, or the result of a certain process,” for such patents “would prohibit all other persons from making the same thing by any means whatsoever.”); *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 927 F.3d 1333, 1344–49 (Fed. Cir. 2019) (Chen, J., concurring in denial of rehearing en banc) (explaining how the Supreme Court in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66 (2012) and *Alice Corp. Pty. v. CLS Bank Int'l*, 573 U.S. 208 (2014) resurrected the point of novelty inquiry from *Parker v. Flook*, 437 U.S. 584 (1978), which many, including this court, thought had been rejected in *Diamond v. Diehr*, 450 U.S. 175 (1981)).

Consider the example of an automaker CEO who announces a stretch goal to her engineers to produce a car,

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powered by electricity, that can be driven 1,000 miles without a recharge. That declaration from the CEO does not make her an “inventor” and the section 101’s judicial exceptions bar the grant of a patent for such a claim, for it fails to recite any arguable act of invention to reach the claimed result. Like Mr. Morse’s claim 8, this claim recites a law of nature, and also like Mr. Morse’s claim 8, the claim’s fundamental problem is there is no there there. Without any content in the claim that can even be arguably regarded as some form of a means or method beyond the use of electricity, the claim is invalid under *O’Reilly* without having to consider other validity grounds, such as enablement, for example.

Assessing claim validity under section 101 is difficult work and our court over a series of many decisions in recent years has attempted to extract principles articulated in Supreme Court opinions, both old and new. Differences of opinion within our court on how to apply those principles to a particular case inevitably arise from time to time, given the inherently imprecise nature of the legal framework. But today’s panel majority decision is consistent with both Supreme Court and our court’s precedent and its decision as to claims 1 and 22 does not strike me as warranting en banc intervention.

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

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**AMERICAN AXLE & MANUFACTURING, INC.,**  
*Plaintiff-Appellant*

v.

**NEAPCO HOLDINGS LLC, NEAPCO DRIVELINES  
LLC,**  
*Defendants-Appellees*

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2018-1763

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Appeal from the United States District Court for the District of Delaware in No. 1:15-cv-01168-LPS, Chief Judge Leonard P. Stark.

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NEWMAN, *Circuit Judge*, with whom MOORE, O'MALLEY, REYNA, and STOLL, *Circuit Judges*, join, dissenting from denial of the petition for rehearing en banc.

The court's rulings on patent eligibility have become so diverse and unpredictable as to have a serious effect on the innovation incentive in all fields of technology. The victim is not only this inventor of this now-copied improvement in driveshafts for automotive vehicles; the victims are the national interest in an innovative industrial economy, and the public interest in the fruits of technological advance. I share the concerns of my colleagues in dissent, and I write to emphasize the far-reaching consequences of the court's flawed Section 101 jurisprudence.

The court's new spin on Section 101 holds that when technological advance is claimed too broadly, and the claims draw on scientific principles, the subject matter is barred "at the threshold" from access to patenting. As here, where the invention is found to embody a principle of physics called "Hooke's law," the court rules that the invention is ineligible for patenting as a matter of law.

All technology is based on scientific principles—whether or not the principles are understood. The Supreme Court long ago recognized that what is required for patentability is that the inventor describes the useful application of discovery. The Court then and now understood the distinction between the basic principles of science and their practical application. See, for example, *Le Roy v. Tat-ham*, 55 U.S. 156 (1852):

The word *principle* is used by elementary writers on patent subjects, and sometimes in adjudications of courts, with such a want of precision in its application, as to mislead. It is admitted, that a principle is not patentable. A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.

*Id.* at 174–75 (emphasis in original). This understanding is fundamental to the system of patents, implementing the constitutional purpose of promoting the progress of science and useful arts. The Court further stated:

[T]he processes used to extract, modify, and concentrate natural agencies, constitute the invention. The elements of the power exist; the invention is not in discovering them, but in applying them to useful objects.

*Id.* at 175. The Supreme Court has reiterated this balance between abstract principle and practical application:

[W]e tread carefully in construing this exclusionary principle lest it swallow all of patent law. At some level, “all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.” Thus, an invention is not rendered ineligible for patent simply because it involves an abstract concept. “Applications” of such concepts “to a new and useful end,” we have said, remain eligible for patent protection.

*Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014) (internal citations and alterations omitted).

Precedent illustrates application of these principles to evolving technologies; for example, radio: “While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be.” *MacKay Radio & Telegraph Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939). See also, e.g., *Diamond v. Diehr*, 450 U.S. 175 (1981):

Our earlier opinions lend support to our present conclusion that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. . . . It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.

*Id.* at 187 (emphasis in original). Until recently, Federal Circuit precedent appropriately implemented the law; for example, *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016) (“The ‘directed to’ inquiry, therefore, cannot simply ask whether the claims involve a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions involves a law of nature and/or natural phenomenon—after

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all, they take place in the physical world.”); *see also In re TLI Comm’cns LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016) (“But in determining whether the claims are directed to an abstract idea, we must be careful to avoid oversimplifying the claims because ‘[a]t some level, ‘all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.’” (quoting *Alice Corp.*, 573 U.S. at 217)).

However, the case now before us departs from these rulings, adding to the concerns of *amici curiae* that “[t]he panel majority’s decision reflects a five-year trend of courts severely narrowing the range of inventions and discoveries eligible for patent protection under the two-step *Mayo-Alice* inquiry, contrary to historical practice and precedent.” 12 Law Profs. Br. 2.

Section 101 of the patent statute is designed as an all-encompassing introduction to the subject matter of invention and discovery:

35 U.S.C. § 101. Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

A valid patent must meet the “conditions and requirements” of the patent statute; eligibility under Section 101 is not the same as patentability under the substantive statutory provisions of novelty (§ 102), non-obviousness (§ 103), and description and enablement (§ 112). Yet the court accepts the argument made by defendant Neapco, the admitted copier of the American Axle invention, that “it always has been, the breadth of a claim is critically material to the § 101 inquiry. The fact that breadth is also material to enablement (and written description, novelty, and obviousness as well) does not mean that it cannot be relevant to § 101.” Neapco Br. 4. That is incorrect.

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Breadth of claiming is a matter of the scope and content of the description and enablement in the specification, considered in light of the prior art, as investigated during PTO examination. The notion that any reliance on a scientific principle in the claimed subject matter affects eligibility under Section 101 itself warrants *en banc* rehearing.

The panel majority holds that some claims hereof are, “without more,” a claim to a scientific principle, and that it is irrelevant whether the application is new, non-obvious, and enabled. This theory has found support in half of the court, now declining *en banc* review. Our missteps are conspicuous in the panel majority’s treatment of “Hooke’s law,” which is stated to be the basis for the majority’s ruling of ineligibility, although we are not told Hooke’s law or how it invalidates American Axle’s new automotive driveshaft.

Hooke’s law is not defined in the parties’ briefs. However, it is reported in the Encyclopædia Britannica, at <https://www.britannica.com/science/Hookes-law>:

Mathematically, Hooke’s law states that the applied force  $F$  equals a constant  $k$  times the displacement or change in length  $x$ , or  $F = kx$ . The value of  $k$  depends not only on the kind of elastic material under consideration but also on its dimensions and shape.

The panel majority does not explain how Hooke’s formula  $F = kx$  for the compression of springs renders the ’911 patent’s automotive driveshaft ineligible for access to the patent system. One need only look at claim 1, the broadest claim, to observe that this is a straightforward form of claim, for which eligibility is routine:

1. A method for manufacturing a shaft assembly of a driveline system, the driveline system further including a first driveline component and a second driveline component, the shaft

assembly being adapted to transmit torque between the first driveline component and the second driveline component, the method comprising: providing a hollow shaft member; tuning at least one liner to attenuate at least two types of vibration transmitted through the shaft member; and positioning the at least one liner within the shaft member such that the at least one liner is configured to damp shell mode vibrations in the shaft member by an amount that is greater than or equal to about 2%, and the at least one liner is also configured to damp bending mode vibrations in the shaft member, the at least one liner being tuned to within about  $\pm 20\%$  of a bending mode natural frequency of the shaft assembly as installed in the driveline system.

'911 patent, col. 10, ll. 10–27.

Our colleagues apparently find differences in eligibility between claim 1 and claim 22:

22. A method for manufacturing a shaft assembly of a driveline system, the driveline system further including a first driveline component and a second driveline component, the shaft assembly being adapted to transmit torque between the first driveline component and the second driveline component, the method comprising: providing a hollow shaft member; tuning a mass and a stiffness of at least one liner; and inserting the at least one liner into the shaft member; wherein the at least one liner is a tuned resistive absorber for attenuating shell mode vibrations and wherein the at least one liner is a tuned reactive absorber for attenuating bending mode vibrations.

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'911 patent, col. 11, ll. 24–36. Our colleagues, writing to support denial of rehearing en banc, propose that there is a Section 101 distinction between claim 1 and claim 22, and draw analogy to claim 8 of Samuel Morse's telegraph patent, Judge Dyk explaining that "claim 8 of *O'Reilly* specifically did not limit itself to the specification and for that reason was found ineligible." J. Dyk concurrence at 2 n.1. However, claim 8 was not rejected because it was not limited to the specification, it was rejected because it proposed to claim electromagnetism as a scientific principle. If the panel majority is holding that eligibility to claim an invention employing a scientific principle depends on whether the principle is mentioned in the specification, clear instructions must be given.

For the American Axle claims, neither the district court nor this court considered the prior art or other patentability factors including written description and enablement. Yet it is apparent that these claims are for an automotive driveshaft, not for an abstract idea or law of nature or mathematical formula. We are not told how  $F = kx$  renders these claims ineligible for patenting.

The distinction between basic scientific principle and practical embodiment is the story of technology and industry. The *amici curiae* 12 Law Professors remind us that: "All inventions of practically applied processes and machines are reducible to mathematical abstractions and algorithms; for example, a patentable method for operating a combustion engine is really just an application of the law of  $PV=nRT$ , the principles of thermodynamics, and other laws of nature comprising the principles of engineering." 12 Law Profs. Br. 9 (quoting Adam Mossoff, *A Brief History of Software Patents (and Why They're Valid)*, 56 Ariz. L. Rev. Syllabus 65, 71 (2014)).

Nonetheless, the majority deems irrelevant whether the claimed subject matter meets the requirements of Sections 102, 103, and 112. We don't know whether there are

substantive issues of claim scope related to invalidity or infringement. I take note of the protestations that this opinion is limited, but if the court indeed intends to limit its holding to driveshafts for automotive vehicles, *en banc* instruction is a necessity. Instead, the court furthers the debilitation of Section 101. As stated by *amicus curiae* Biotechnology Innovation Organization:

[T]here continues to be unabated uncertainty about the patent eligibility of inventions across an expanding range of technologies, including biotechnology. The unstable state of patent-eligibility jurisprudence affects modern biotechnologies ranging from biomarker-assisted methods of drug treatment to companion diagnostic tests, fermentation products, industrial enzyme technology, and marker-assisted methods of plant breeding.

BIO Br. 1. Other *amici curiae* reinforce these concerns. As summarized by *amicus curiae* Judge Paul R. Michel (Ret.), “the § 101 rulings-at-issue threaten to undercut patent law and its innovation-promoting goals. . . . The panel’s decision is legally incorrect and ill-advised.” Michel Br. 1. And *amicus curiae* practitioner Jeremy C. Doerre states that “the implicit judicial exception to 35 U.S.C. § 101 for natural laws is ill-suited to police overbroad [claims].” Doerre Br. 4–5.

The need for judicial provision of stable and comprehensible patent law is of increasing urgency. “Legal protection of inventions and discoveries that once was a defining characteristic of U.S. industrial policy has become increasingly irrelevant, no longer providing adequate comfort to investors willing to make high risk commitments of time and capital or to inventors who would leave secure jobs to pursue visions of breakthrough technologies and challenge entrenched incumbents.” Alliance of U.S. Startups & Inventors for Jobs Br. 2–3 (showing survey results conducted by Professor Taylor at SMU, documenting

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“[t]he growing unwillingness of inventors and investors to rely on patents in tackling promising but risky new technologies harbingers badly for the United States”). *Amicus curiae* Alliance states that “If left standing, the decision has the potential for expanding ineligibility under Section 101 to threaten most every invention for which a patent has ever been granted,” *id.* at 5,—as exemplified in the case here before us.

The court’s notion that the presence of a scientific explanation of an invention removes novel and non-obvious technological advance from access to the patent system, has moved the system of patents from its once-reliable incentive to innovation and commerce, to a litigation gamble. It is essential to restore the incentive role of the system of patents, for technology is the foundation of the nation’s economy, trade, and strength.

There is no room for second best in our dependence on correct, just, and wise application of the law. I respectfully dissent from the court’s denial of the request for rehearing *en banc*.

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

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**AMERICAN AXLE & MANUFACTURING, INC.,**  
*Plaintiff-Appellant*

v.

**NEAPCO HOLDINGS LLC, NEAPCO DRIVELINES  
LLC,**  
*Defendants-Appellees*

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2018-1763

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Appeal from the United States District Court for the District of Delaware in No. 1:15-cv-01168-LPS, Chief Judge Leonard P. Stark.

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STOLL, *Circuit Judge*, with whom NEWMAN, MOORE, O'MALLEY, and REYNA, *Circuit Judges*, join, dissenting from the denial of the petition for rehearing en banc.

I write to dissent from the denial of the petition for rehearing en banc because the majority's decision extends § 101 to place in doubt the patent eligibility of historically eligible mechanical inventions, and thus presents "a question of exceptional importance" that warrants consideration by the full court. Fed. R. App. P. 35(a)(2). I share Judge Moore's concerns about the majority's "nothing more" test and its application in this case, particularly on this procedural posture. The majority has, to a limited extent, cabined the scope of its prior decision on panel

rehearing, but I am concerned that its new decision only serves to introduce additional questions—including how to apply the “nothing more” test—that would benefit from further development and contemplation through en banc review.

The majority asserts that its “nothing more” test is not new, and is instead firmly grounded in precedent such as *O’Reilly v. Morse*, 56 U.S. 62 (1853). I disagree. The claim held ineligible in *O’Reilly* is distinguishable on its face. It was not limited to any particular machinery and was instead broadly directed to the use of electromagnetism, “however developed,” for transmitting information. *Id.* at 112. And as amici point out, several of Samuel Morse’s other claims were held eligible in that very same case, and they more closely resemble the claims at issue here. *See* Law Prof. Br. 6–8; *see also O’Reilly*, 56 U.S. at 85–86 (listing claims). For example, one of the patent-eligible claims expressly recites applying a natural law, “the motive power of magnetism,” to produce a result, “telegraphic communication at any distances.” *O’Reilly*, 56 U.S. at 85 (quoting U.S. Reissue Patent No. 117). It is difficult to square that outcome in *O’Reilly* with the majority’s application of the “nothing more” test here.

The majority, along with Judge Dyk and Judge Chen in their concurrences, contend that the *O’Reilly* Court held these claims eligible because they include phrases such as “substantially as set forth in the foregoing description,” which, in their view, incorporated subject matter from the specification into the claims. But *O’Reilly* does not expressly rely on any such incorporation by reference. Instead, it characterizes the ineligible claim as being directed to “an effect produced by the use of electro-magnetism,” as opposed to “the process or machinery necessary to produce” that effect. 56 U.S. at 120. That distinction is entirely consistent with the eligibility of the claims at issue here, for they recite the process and machinery necessary to produce the desired effect of reducing vibrations in a shaft

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assembly. And, although *O'Reilly* does describe the ineligible claim as “outside” and “beyond” the specification, *id.* at 119–20, it does not necessarily follow that the other claims were eligible because of any particular incorporation by reference. See *Dolbear v. Am. Bell Tel. Co.*, 126 U.S. 1, 534 (1888) (“The effect of [*O'Reilly*] was . . . that the use of magnetism as a motive power, without regard to the particular process with which it was connected in the patent, could not be claimed, but that *its use in that connection could.*” (emphasis added)). Thus, the majority’s “nothing more” test appears to be a new development with potentially far-reaching implications in an already uncertain area of patent law. On that basis alone, this case deserves en banc review, including an opportunity for the parties and other stakeholders, such as the U.S. Patent and Trademark Office, to address the merits of the new “nothing more” test.

Judge Chen also claims in his concurrence that the majority did not create a new test, characterizing the majority’s decision as a “straightforward application” of the “*O'Reilly* test” that is “consistent with long-standing precedent.” *E.g.*, Chen Concurring Op. 1, 4, 6. While I appreciate the importance of *O'Reilly* as Supreme Court precedent addressing eligibility, I note that Judge Chen does not identify any prior court opinions or articles that specifically refer to an “*O'Reilly* test,” nor am I aware of any. To the extent that the Supreme Court has cited *O'Reilly*, it has been for the general propositions that there is an implicit exception to § 101 and that preemption is an important concern in patent law. See, e.g., *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (citing *O'Reilly* in support of the implicit exception to § 101); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 85 (2012) (discussing *O'Reilly* to illustrate preemption concerns); *Diamond v. Diehr*, 450 U.S. 175, 187–88 (1981) (citing *O'Reilly* to underscore that an application of a law of nature or mathematical formula may be patent eligible).

Perhaps most notably, the district court opinion in this case never even mentions *O'Reilly*. Finally, if this case presented such a straightforward application of the longstanding “*O'Reilly* test,” why did the majority’s initial opinion not even mention this test?

In his concurrence, Judge Dyk also suggests that the “nothing more” test is not new because the same “linguistic formulation” has been used by this court, the district court, and by the parties. Dyk Concurring Op. 8–10 & n.4–7. In doing so, the concurrence provides nothing to further elucidate what the “nothing more” test entails, and in my view, makes the test even more confusing and uncertain. The fact that the phrase “nothing more” has been employed a few times in our recent § 101 jurisprudence provides little insight into its scope and application as a legal test. These scattered references, furthermore, provide little assurance that any legal test is being applied consistently and in accordance with the principles set forth by the Supreme Court in cases like *O'Reilly*. Indeed, the fact that “nothing more” has begun to appear in our § 101 precedent only further confirms that it would be prudent to review its application now. I am left even more convinced that we should hear this case en banc.

The majority’s reasoning also introduces further uncertainty by blurring the line between patent eligibility and enablement. While the eligibility inquiry may take into account whether a claim has “the specificity required to transform a claim from one claiming only a result to one claiming *a way* of achieving it,” *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167–68 (Fed. Cir. 2018) (emphasis added) (collecting cases), the majority’s “how to” analysis seems to go further, potentially incorporating a heightened enablement requirement into § 101. In my view, a claim can be specific enough to be directed to an application of a law of nature—which is patent eligible—without reciting how to perform all the claim steps. The majority’s conclusion that claim 22 is ineligible demonstrates the flaws in

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its “how to” test. Even assuming that claim 22 applies Hooke’s law (or any other unnamed law of nature), the claim seems sufficiently specific to qualify as an eligible application of that natural law. The claim identifies specific variables to tune, including “a mass and a stiffness of at least one liner.” U.S. Patent No. 7,774,911 col. 11 l. 31. It requires that the tuned liner attenuate specific types of vibration, including “shell mode vibrations” and “bending mode vibrations,” and further requires that the tuned liner is inserted in a “hollow shaft member.” *Id.* at col. 11 ll. 30–36. With this level of specificity, claim 22 appears to be properly directed to “the application of the law of nature to a new and useful end,” not to the law of nature itself. *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948) (collecting cases). Yet this level of detail is insufficient in the majority’s view, and it remains unclear how much more “how to” would have been sufficient to render the claim eligible under the majority’s approach. Here too, en banc review would provide an opportunity for the parties and other stakeholders to address, and the full court to consider, where eligibility analysis stops and enablement analysis begins.

Beyond the uncertainty introduced by the majority’s application of the “nothing more” and “how to” tests, the result reached by the majority should also give us pause. The majority invokes § 101 to hold ineligible a method for manufacturing a drive shaft assembly for a car—a class of invention that has historically been patent eligible. *See, e.g., Diehr*, 450 U.S. at 184 (“Industrial processes . . . have historically been eligible to receive the protection of our patent laws.”). In my view, the result in this case suggests that this court has strayed too far from the preemption concerns that motivate the judicial exception to patent eligibility. The claims at issue here are far removed from the canonical ineligible claim that “simply state[s] the law of nature while adding the words ‘apply it.’” *Mayo*, 566 U.S. at 72 (citing *Gottschalk v. Benson*, 409 U.S. 63, 71–72

(1972)). Indeed, the claims at issue do not recite *any* particular law of nature, much less preempt the use of Hooke’s law in any particular context. Instead, they are directed to a specific “method for manufacturing a shaft assembly” with a liner that attenuates certain types of vibrations. ’911 patent col. 11 ll. 24–36. Even assuming that Hooke’s law is required to tune the claimed liner (despite not being mentioned anywhere in the specification or claims), so are innumerable other laws of nature. And there remain innumerable ways to apply Hooke’s law to achieve the goal of mitigating problematic vibrations in a shaft assembly—perhaps, for instance, by using something other than a liner tuned to attenuate at least two different kinds of vibrations.

I also believe that it is inappropriate for us to announce this new “nothing more” test, and then resolve it on our own when the resolution is subject to factual disputes. This is particularly so here, on review of the district court’s summary judgment of ineligibility. As Judge Moore’s dissent points out, significant evidence, including expert testimony, contradicts the notion that the two types of vibrations identified in the claims can be reduced by Hooke’s law and “nothing more.” In my view, whether the claimed process involves application of Hooke’s law, and whether it involves “nothing more” than Hooke’s law, are both questions of fact. Whether the claims in this case invoke Hooke’s law is not purely a question of claim construction involving intrinsic evidence because nothing in the intrinsic evidence even refers to Hooke’s law. As the Supreme Court has explained, we can evaluate certain evidence *de novo* (the intrinsic record, composed largely of legal documents), but we must evaluate other evidence with deference due to fact findings (everything extrinsic to the record, including expert testimony). *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 324–28 (2015). The scientific question of whether Hooke’s law and “nothing more” reduces the two types of vibration identified in the claims presents a

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question analogous to the conventionality of a particular technology in eligibility analysis, inherency or anticipation in prior art analysis, or the second (comparing) step in an infringement analysis—all of which are factual inquiries. *See, e.g., Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018) (the conventionality of a claim element is a question of fact); *Monsanto Tech. LLC v. E.I. DuPont de Nemours & Co.*, 878 F.3d 1336, 1342 (Fed. Cir. 2018) (anticipation and inherent disclosure are questions of fact); *Ecolab, Inc. v. Envirochem, Inc.*, 264 F.3d 1358, 1369 (Fed. Cir. 2001) (the comparing step of infringement analysis is a question of fact). If the “nothing more” test were treated as involving questions of fact, as it should be, there would be no question that this case would have to be vacated and remanded for fact development at the district court.

Finally, I remain concerned about the practical effect of the majority’s decision, notwithstanding its newly introduced warning that its “holding should not be read as an invitation to raise a validity challenge against any patent claim that requires the application of an unstated natural law.” Maj. 26. In one colorful example, amici suggest that the majority’s original approach would have placed the combustion engine at risk of ineligibility—a proposition that would have seemed absurd just a few years ago, but now seems eerily plausible. Law Prof. Br. 9. Although the majority has dialed back its original decision to some degree on panel rehearing, one can still reasonably ponder whether foundational inventions like the telegraph, telephone, light bulb, and airplane—all of which employ laws of nature—would have been ineligible for patenting under the majority’s revised approach. *See, e.g., id.* at 5–9; IPO Ass’n Br. 9. Despite the majority’s cautionary language, the uncertainty introduced by its analysis will likely invite eligibility challenges to many other patents directed to mechanical inventions or otherwise. *See Michel Br. 7* (“[I]f ‘industrial-process,’ physically-based patents like these are

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ineligible under *Mayo/Alice*, then seemingly every patent is in ineligibility jeopardy.”). Without clear direction from this court, the Patent Office and district courts will likely reach inconsistent results when assessing the patent eligibility of mechanical inventions. Inventors, the patent system, and our innovation-focused economy will bear the cost of the resulting unpredictability. *See* BIO Br. 7–9; USIJ Br. 8–11.

En banc review would provide this court with an opportunity to hear from the parties and various stakeholders, including the Patent Office, which deals with § 101 issues on a daily basis, about how the judicial exception to patent eligibility should apply in the context of mechanical and other inventions that employ unnamed laws of nature. By declining to rehear this case en banc, we have abdicated our responsibility to address patent eligibility head on. In the face of our unwillingness to consider patent eligibility as a full court, I grow more concerned with each passing decision that we are, piece by piece, allowing the judicial exception to patent eligibility to “swallow all of patent law.” *Alice*, 573 U.S. at 217 (citing *Mayo*, 566 U.S. at 70–73). I respectfully dissent.

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

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**AMERICAN AXLE & MANUFACTURING, INC.,**  
*Plaintiff-Appellant*

v.

**NEAPCO HOLDINGS LLC, NEAPCO DRIVELINES  
LLC,**  
*Defendants-Appellees*

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2018-1763

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Appeal from the United States District Court for the District of Delaware in No. 1:15-cv-01168-LPS, Chief Judge Leonard P. Stark.

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O'MALLEY, *Circuit Judge*, with whom NEWMAN, MOORE, and STOLL, *Circuit Judges*, join, dissenting from the denial of the petition for rehearing en banc.

The revised majority opinion issued today attempts to address the many concerns raised by American Axle & Manufacturing, Inc. (“American Axle”) and the half-dozen amici curiae who objected to the substance of the majority’s original opinion. It does this, however, with little concern for proper process—instead achieving its chosen result by whatever means it could conjure. The Advisory Committee on Appellate Rules recently forwarded to all Courts of Appeals a letter from the American Academy of Appellate Lawyers (“the Academy”). The Academy’s letter proposed

a rule that would require us, as an appellate court, to “give notice [when] considering a previously unaddressed ground and provide [the parties] an opportunity to brief it.” Letter from the Academy to Hon. Michael Chagares, Chair Federal Advisory Committee on Appellate Rules (April 26, 2019), *available at* [https://www.appellateacademy.org/publications/Chagares\\_proposal.pdf](https://www.appellateacademy.org/publications/Chagares_proposal.pdf). The Advisory Committee’s cover letter noted a growing belief among appellate lawyers that Courts of Appeals have shown an increasing tendency to decide questions on grounds that were neither argued before the district court nor briefed on appeal. The Advisory Committee explained that it felt the Academy’s concerns were legitimate, but decided that, rather than implement a mandate, it would ask Courts of Appeals, including this one, to voluntarily correct course. It is my hope that we, as an institution, will rise to the Advisory Committee’s challenge.<sup>1</sup> Thus, while I share all the substantive and policy concerns raised by Judge Newman, Judge Moore and Judge Stoll in their dissents, I write separately to emphasize the procedural norms that the majority ignores.

The problems I perceive with the majority opinion are threefold: (1) it announces a new test for patentable subject matter at the eleventh hour and without adequate briefing; (2) rather than remand to the district court to decide the issue in the first instance, it applies the new test itself; and (3) it sua sponte construes previously undisputed terms in a goal-oriented effort to distinguish claims and render them patent ineligible, or effectively so. These obstacle-

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<sup>1</sup> I confess that I have not always stayed on the correct side of the line the Academy would have us draw. That does not free me from the obligation to work harder in the future to avoid deciding cases on unbriefed grounds. And it should not free us as an institution from attempting to rein in egregious instances where our colleagues cross that line.

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avoiding maneuvers fly in the face of our role as an appellate court.

First, the majority announces that a claim is patent ineligible if it “clearly invokes a natural law, and nothing more, to accomplish a desired result.” Maj. 19. The majority contends that this statement of law stems directly from a 19th century Supreme Court case, *O’Reilly v. Morse*, 56 U.S. 62 (1853). As Judge Stoll explains in her dissent, however, this case does not present a clear-cut application of *O’Reilly*. It is, instead, an expansion that would likely render ineligible claims found patent eligible by the *O’Reilly* court itself. Despite this, the majority forges on, adopting a test that was proposed by no one. One might ask why, if appellate judges will reach their desired result regardless of outside input and untethered from the arguments of others, we should bother with the dog and pony show of the full development of a trial record or our admonition to raise all issues in one’s appellate briefs or suffer waiver? Just as the majority was persuaded by the outcry of the public in response to the original opinion, it may have benefited from, or even changed course in view of, comments on this new test. The parties and the public should have been given a chance to weigh in.

Second, the majority’s choice to apply its new test to this case, again without briefing, is troubling. As Judge Moore and Judge Stoll each explain, the “nothing more” test presents *factual* questions. Does the claim clearly invoke a natural law? Which one? How do we know there is nothing more? Where, as here, the claims say nothing about any *natural law*, these are scientific questions that must be answered by reference to expert testimony—testimony which, as developed to date in this case, does not answer these questions as the majority now does. While the district court made some general statements about Hooke’s Law and friction damping, it was not applying the test articulated by the majority today. The district court opinion makes no mention of *O’Reilly* and certainly did not find

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“nothing more.” *See Am. Axle & Mfg., Inc. v. Neapco Holdings LLC*, 309 F. Supp. 3d 218, 225 (D. Del. 2018). Given this, at minimum the majority should have remanded with an instruction for the district court to consider the factual record and decide the issue in the first instance. Or, assuming arguendo that the majority is correct to treat this as question of law, it should have remanded for the district court to consider the issue afresh using that lens. It seems that the majority was just too deep in the § 101 hole it originally dug to give up control. Thus, rather than follow the prudent path, the majority took it upon itself to invalidate these claims *today*. The decision ignores that we are a court of review and steps far outside the bounds of our role as appellate judges.

Finally, the majority’s treatment of claim 1 is perhaps most emblematic of the concerns raised by the Academy. Sua sponte, and without the aid of supplemental briefing, the majority construes claims 1 and 22 to have a patentably distinct difference—“inserting” versus “positioning” of the claimed liner. Maj. 25 n.13. No one argued that these terms are meaningfully, much less patentably, different and no one asked the trial court to compare or assess them. While the majority points out that no one argued the terms share the *same* meaning, that is irrelevant and unsurprising. That the parties failed to raise this argument only underlies that this was not an important issue, either before the district court or on appeal. The majority uses the minor wording difference as a hook and notes that claim 1 is “more general” than claim 22, so that it can set up the framework for an abstract idea-based § 101 decision. It then remands to the district court to effectuate that goal, even though this issue was not argued to the district court in the first instance. Maj. 24–26. This unrequested second chance for Neapco Holdings LLC is unwarranted and leaves American Axle trapped in § 101 purgatory. It is not our role as an appellate court to direct the litigation

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strategy of the parties or to pressure the district court into invalidating claims on grounds never argued to it before.

The active judges of this Court were evenly divided, 6-6, in our vote on whether to take this case en banc based on the serious substantive concerns the new majority opinion raises. In such circumstances, important institutional concerns such as the ones discussed above should push the vote over the line. I respectfully dissent from the full Court's unwillingness to put us back on course and force adherence to the limitations imposed on us as a court of review.