2018-1763

In The

United States Court Of Appeals
For The Federal Circuit

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

v.

NEAPCO HOLDINGS LLC; NEAPCO DRIVELINES LLC,
Defendants - Appellees.

ON APPEAL FROM UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE
CASE NO. 1:15-CV-01168-LPS

BRIEF OF APPELLEES

Dated: September 21, 2018

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U.S. Patent No. 7,774,911, 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.

Appx35

CERTIFICATE OF INTEREST

Pursuant to Federal Circuit Rules 26.1 and 47.4, counsel for Defendants-Appellees Neapco Holdings LLC and Neapco Drivelines LLC, certifies the following:

1. The full name of every party represented by me is:

Neapco Holdings LLC
Neapco Drivelines LLC

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

Neapco Holdings LLC
Neapco Drivelines LLC

3. All parent corporations and any publically-held companies that own 10% or more of the stock of any party represented by me are:

Neapco Holdings LLC
Wanxiang Automotive Components, LLC

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this Court (and who have not or will not enter an appearance in this case) are:

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5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal:

Not Applicable.

Dated: September 21, 2018

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NOTES

Unless otherwise indicated, all ***emphasis*** in this brief has been added.

STATEMENT OF RELATED CASES

Defendants-Appellees Neapco Holdings LLC and Neapco Drivelines LLC (collectively, "Neapco" or "Defendants") are not aware of any case pending in this Court or any other court or agency that will directly affect or be directly affected by this Court's decision in this appeal.

INTRODUCTION

The natural relationship between an object's mass, stiffness, and frequency, known as Hooke's law, is centuries old. It is—as American Axle's corporate witness and one of the named inventors testified—just "basic physics." Appx1757 (Sun Tr. 92:15-93:2). Such a fundamental building block of scientific inquiry is ineligible for patenting, and so too are claims that merely recite the natural relationship and instruct one to "apply it" in a particular technological environment. But that is all American Axle's claims do.

American Axle did not invent or discover Hooke's law. Nor did it invent or discover the basic subject matter of its claims—using a cardboard liner inside a vehicle's propshaft to dampen vibration. As the asserted '911 patent itself makes clear, the use of such liners to reduce vibration is decades old. *See* Appx30, 1:53-2:38. The only purported contribution was the idea to "tune" liners by applying Hooke's law to attempt to further dampen vibration. To that end, the claims recite a "method" consisting of three active steps: "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." Appx35 (claim 22). But American Axle is not entitled to monopolize the basic concept of applying Hooke's law to the lining of a propshaft, nor is it entitled to preempt others from using the abstract concept of "tuning." However parsed, these claims fail to recite patentable subject matter.

The district court came to that conclusion after a thoughtful analysis under the Supreme Court's two-part test for patent subject-matter eligibility. At step one, it was correct to conclude that the claims, "considered as a whole," "do not disclose a method of manufacturing a propshaft," but rather "are directed to the mere application of Hooke's law." Appx11. At step two, it was correct in finding no "inventive concept," concluding that the claims do no more than suggest to an engineer to "consider that law of nature [Hooke's law] when designing propshaft liners to attenuate driveline vibrations." Appx15.

The Supreme Court's guidance in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, is particularly instructive here. "Einstein . . . could not have patented his famous law by claiming a process consisting of simply telling linear accelerator operators to refer to the law to determine how much energy an amount of mass has produced (or vice versa). Nor could Archimedes have secured a patent for his famous principle of flotation by claiming a process consisting of simply telling boat builders to refer to that principle in order to determine whether an object will float." 566 U.S. 66, 78 (2012). So too here. American Axle cannot patent Hooke's law simply by telling an engineer to "tune" a liner by adjusting its mass and stiffness to alter its frequency.

The claims are fatally flawed for another, related reason. As this Court recognized in *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir.

2016), "'there is a critical difference between patenting a particular concrete solution to a problem and attempting to patent the abstract idea of a solution to the problem in general.'" *Id.* at 1356 (quoting district court's decision). American Axle's claims do the latter: they do not recite a "'specific way'" of tuning, or a "'particular implementation'" of a tuned liner, but rather "'they purport to monopolize every potential solution to the problem.'" *See id.* (quoting district court's decision). The "common-sense distinction" between trying to claim the "ends sought" instead of a "particular means of achieving them" further informs the § 101 analysis, and provides additional support for the district court's judgment of invalidity. *Id.*

American Axle's response is misdirection. It tries to avoid the two-step framework altogether by arguing that the claim must expressly recite the term "Hooke's law" or its specific equation in order to be directed to a law of nature. It likewise argues that a method-of-manufacturing claim is, per se, patentable. But these arguments elevate form over substance, and would leave patent eligibility in the hands of a clever draftsperson, a result that the Supreme Court in *Mayo* reaffirmed was impermissible. *See* 566 U.S. at 72.

American Axle also tries to prop up its claims under the two-step framework by focusing on elements, steps, and methodologies, such as computer modeling, that appear nowhere in the claims. But of course it is the actual claim language that controls. Finally, American Axle points to supposed disputes of fact, but none exist

where, as here, the asserted patent itself removes any doubt about the conventional nature of the method steps (apart from the natural laws themselves).

Ultimately, in the district court's words, "the Asserted Claims are nothing more than applying a law of nature to a conventional method to achieve an abstract solution to a problem." Appx18. That is the very definition of unpatentable subject matter. The district court's well-reasoned decision should be affirmed.

STATEMENT OF THE ISSUE

Whether the district court correctly held the asserted claims of U.S. Patent No. 7,774,911 invalid under 35 U.S.C. § 101 for claiming patent ineligible subject matter.

STATEMENT OF THE CASE

I. Background of the Relevant Technology

The asserted patent, No. 7,774,911, relates to propeller shafts (propshafts) used in vehicle drive train systems, and purports to address the problem of vibration in such propshafts. Appx23-35. A propshaft (20, shown below in red) is located between a vehicle's transmission (18, green) and its axle (22, here, the rear axle, in blue):

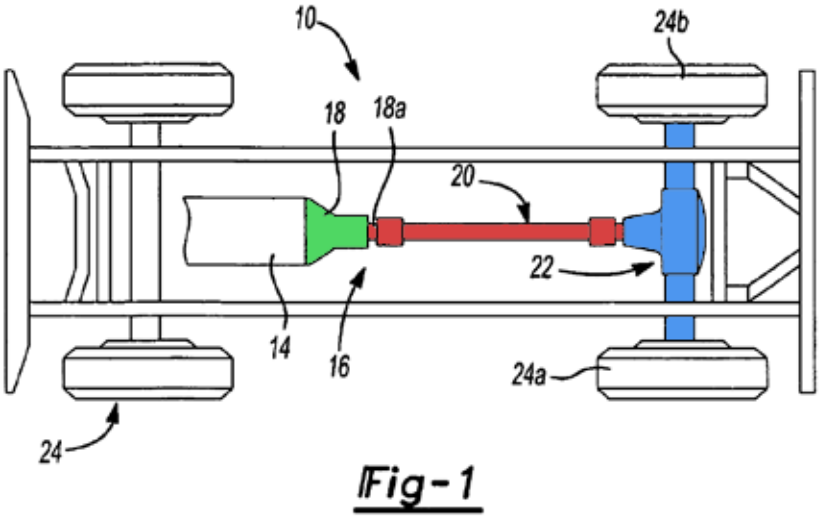


Fig-1

Appx24, Fig. 1. The propshaft transmits rotary power from the transmission to the rear axle. Appx30, 1:38-52. Propshafts are prone to vibrate, producing unwanted

noise. *Id.* Vibration may occur along each of the propshaft's three axes, resulting in three vibration modes: bending, torsion, and shell. *Id.*

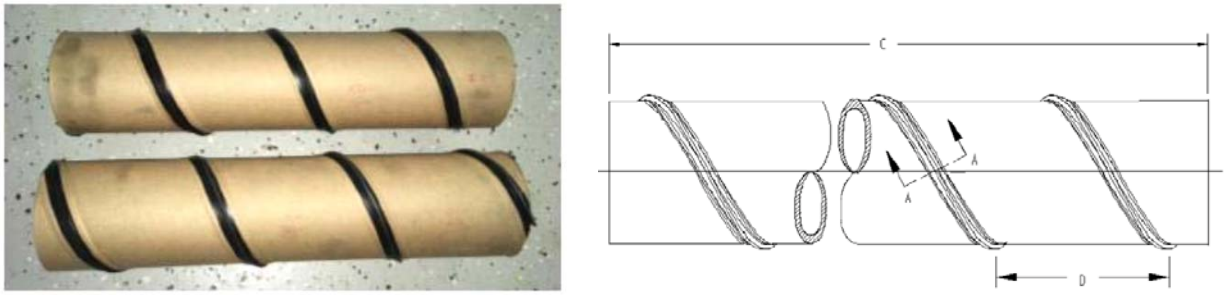
A. Automobile Manufacturers Have Long Inserted Cardboard Liners With Rubber Winding Into Propshafts To Reduce Vibration

As the '911 patent recognizes, engineers have long "employed" "[s]everal techniques…to attenuate vibration in propshafts including [by] the use of weights and liners." Appx30, 1:53-54. For example, the '911 patent lists four patents—U.S. Pat. Nos. 2,751,765; 4,014,184; 4,909,361; and 5,976,021—dating back as early as 1956, each disclosing the use of cardboard liners as "a resistive means for attenuating shell mode vibration" in propshafts. *Id.* at 2:34-36. In describing these prior art solutions, the '911 patent explains: "The '765 and '184 patents appear to disclose hollow multi-ply cardboard liners that are press-fit to the propshaft; the cardboard liners are relatively long and appear to extend substantially coextensively with the hollow shaft." *Id.* at 2:25-29. It continues: "The '361 and '021 patents appear to disclose liners having a hollow cardboard core and helical retaining strip that extends a relatively short distance (e.g., 0.03 inch) from the outside diameter of the core. The retaining strip has high frictional properties to frictionally engage the propshaft." *Id.* at 2:29-34.

Outside of the prior art patents, other evidence establishes that the use of such cardboard liners has been in practice well before the '911 patent. Neapco engineer Rob Wehner testified that Visteon Corporation ("Visteon"), Neapco's predecessor,

first manufactured aluminum propshafts having cardboard liners with rubber winding for the 1990 model year Ford F-150 program. Appx1293, 27:24-29:16; Appx1325, 156:19-21; Appx1326, 159:24-160:4. Engineering drawings of Visteon's early cardboard liners corroborate Mr. Wehner's testimony. Appx1401-1402 (Becker Rep. ¶¶ 32-34). Visteon continued to make propshafts for the F-150 in later model years, and Neapco continues to do so today. Appx1403 (Becker Rep. ¶ 35).

Other examples of Visteon cardboard liners likewise pre-date the '911 patent. For example, Visteon was using two cardboard liners with rubber winding in the Ford E-150 Econoline van, beginning with the 2003 model year. *E.g.*, Appx1326 (Wehner Tr. 161:5-21); Appx1580-1586 (Becker Rep. ¶¶ 124-136). The images below show physical samples (left) and engineering drawings (right) of the cardboard liners that Visteon used in the 2003 Econoline propshaft:



Appx1580-1586 (Becker Rep. ¶¶ 124-136).

B. The '911 Patent's Alleged Contribution Is The Concept Of "Tuning" The Liner

While acknowledging the prior art use of cardboard liners as a "resistive means for attenuating shell mode vibration," the '911 patent criticizes them as "[un]suitable for attenuating bending mode vibration or torsion mode vibration." Appx30, 2:35-38. To overcome that, the '911 patent discloses the concept of tuning the liner to the natural frequency of one of the vibration modes in the propshaft. Appx33, 7:31-55.

Specifically, to reduce shell mode vibration, the '911 patent provides that "the liner(s)…is/are tuned to a natural frequency corresponding to at least one of a first shell mode, a second shell mode and a third shell mode." *Id.* at 7:44-46. Likewise, "to attenuate bending mode vibrations," the liners are "tuned to a natural frequency corresponding to at least one of a first bending mode, a second bending mode and a third bending mode of the propshaft[.]" *Id.* at 7:46-51. And "to attenuate torsion mode vibrations," liners are "tuned to a natural frequency of the driveline 16 in a torsion mode[.]" *Id.* at 7:51-55.

The specification discloses that tuning is accomplished by altering the "mass" and "stiffness" of the liner. For example, the abstract states: "The liner has a mass and a stiffness that are tuned such that the liner is a tuned resistive absorber for attenuating" shell mode, bending mode, and/or torsion mode vibrations. Appx23. The Summary of the Invention, in two separate places, provides that the inventive

method includes "tuning a mass and a stiffness of at least one liner." Appx31, 3:14-15; 3:26-27. The '911 patent's Detailed Description also discloses:

> ***[T]he mass and the stiffness of the liner(s) 204 are tuned*** to the driveline 16 such that the liner(s) 204 act or act as (a) a tuned resistive absorber for attenuating shell mode vibrations; and (b) as one or more of (i) a tuned reactive absorber for attenuating bending mode vibrations, and (ii) a tuned reactive absorber for attenuating torsion mode vibrations.

Appx33, 7:32-39.

To that end, the '911 patent lists "various characteristics" that can be "controlled to tune [the liner's] damping properties," including: "mass, length and outer diameter of the liner 204, diameter and wall thickness of the structural portion 300, material of which the structural portion 300 was fabricated, the quantity of the resilient members 302, the material of which the resilient members 302 was fabricated, the helix angle 330 and pitch 332 with which the resilient members 302 are fixed to the structural portion 300, the configuration of the lip member(s) 322 of the resilient member 302, and the location of the liners 204 within the shaft member 200." Appx33, 7:56-8:3.

American Axle's expert, Dr. Christopher Rahn, opined that one of skill in the art would know that these various design characteristics boiled down to the two variables that matter: "mass and stiffness." Appx169 (Rahn CC Decl. ¶ 65). He explained that one of skill in the art "would understand after reading the patents and

based on their knowledge and experience that tuning involves controlling the characteristics (e.g. mass and stiffness) of the liner through, for example, its design, manufacturing, and installation to reduce vibration at a relevant frequency." *Id.*; *see also id.* ¶ 64 ("[T]he specification further describes how a liner is tuned, i.e., by controlling its characteristics. . . . These characteristics include mass and stiffness.").

Similarly, American Axle's corporate witness and named inventor, Dr. Zhaohui Sun, testified that tuning boils down to "adjusting the stiffness and mass" of a liner, and that such tuning is accomplished using the many variables listed in the patent:

> Q. In what ways can you tune a liner by adjusting the stiffness and mass?
>
> A. You have all the variables you can do. Use different paper, different paper thickness, different length, different diameter and to change the mass. You can change your rubber geometry, rubber material property, rubber number of windings, your pitch distance between the rubber and/or the pitch angle. You can define interference fit, the – you know, that's probably – it's not a fully list, but a lot of variables you can change to influence your tuning.

Appx1751-1752 (Sun Tr. 69:16-70:1).

C. The Claims Merely Recite Generic "Tuning" Of The Liner By Controlling Its Mass and Stiffness

American Axle asserted claims 1-6, 12-13, 19-24, 26-27, 31, and 34-36 of the '911 patent. Independent claim 22 is representative:

> [preamble] 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:
>
> [a] providing a hollow shaft member;
>
> [b] tuning a mass and a stiffness of at least one liner; and
>
> [c] inserting the at least one liner into the shaft member;
>
> [d] 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.

Appx35 (bracketed language added).

With respect to the preamble, neither party has ever argued that it is limiting.

With respect to step [b], the district court construed the term "tuning a mass and stiffness of at least one liner" as "controlling a mass and stiffness of at least one liner to configure the liner to match a relevant frequency or frequencies." Appx1047.

With respect to limitation [d], which is not a method step, but merely describes the result of the method, the district court construed "tuned resistive absorber for attenuating shell mode vibrations" as "a liner having characteristics configured to match a relevant frequency or frequencies to deform as vibration energy is transmitted through the liner to absorb the vibration energy to dampen shell mode

vibrations." *Id.* The district court construed the term "tuned resistive absorber for attenuating bending mode vibrations" in a similar way. *Id.*

Although it now argues otherwise for the first time on appeal, American Axle told the district court that "[t]he differences between [claim] 22 and [claim] 1 are minor." Appx6184-6185 (AAM Supp. SJ Br.). In doing so, it merely pointed out that unlike the open-ended claim 22, claim 1 specifies the amount of dampening required—"greater than or equal to about 2%" for shell mode, and "about ±20% of a bending mode natural frequency." *Id.* at Appx6185.

D. The Claimed "Tuning" Is Nothing More Than A Recitation Of Hooke's Law—The Natural Relationship Between An Object's Mass, Stiffness, and Frequency

Hooke's Law is a basic, fundamental principle of physics, named after 17th century physicist Robert Hooke. It defines the natural relationship between an object's mass, stiffness, and frequency. Appx1603 (Becker Rep. ¶ 174). It begins with the premise that the force (F_s) needed to displace a spring is linearly proportional to the displacement (x); that is, $F_s = kx$, where k is the stiffness of the spring. *See id.* In a system where an object is oscillating, according to Hooke's law, the object's natural frequency (f_n) is a function of two variables, the object's stiffness (k) and its mass (m): $f_n = (k/m)^{\wedge 0.5}$. *See id.* This formula is mathematically identical to the depiction of Hooke's Law in American Axle's Brief. (*See* American Axle's Principal Brief, Dkt. 16, at 19 (hereinafter "AAM Br.").) The only change is the

substitution of the Greek letter omega (ω) for f_n, and the use of a square root symbol instead of a fractional power.

For an object such as a damper, therefore, one can predictably adjust the mass and/or stiffness of the damper to set the damper's natural frequency at a desired level. *See id.* In that way, a damper can be "tuned" to match the natural frequency of another object. *See id.*

Tuning itself, of course, is not novel, and American Axle does not purport to have conceived of it. Musicians have tuned their instruments—tightening the strings on their guitars to change their stiffness and to achieve a desired frequency—for as long as instruments have existed. *E.g.*, Appx519; Appx599-600 (Dr. Olgac Rep. ¶ 14).

E. American Axle's Witnesses Agreed That The Claimed "Tuning" Was Merely Hooke's Law

The concept of tuning an object by adjusting its mass and/or stiffness, as one of the named inventors of the '911 patent (Dr. Sun) and American Axle's corporate witness readily admitted, is nothing more than "basic physics:"

> Q. But to change the frequency of any damper, it comes down to basic physics, doesn't it; changing the mass or the stiffness of that damper, that will adjust the frequency?
>
> A. You change a tuned liner, yeah, by adjusting the controlling variables and to get to the tuning that is needed.
>
> Q. And one of those variables is the stiffness, correct?

A. Correct.

Q. And one of them is the mass, correct?

A. Yes.

Q. And that's basic physics, right?

A. Yes.

Appx1757 (Sun Tr. 92:15-93:2).

Dr. Sun further confirmed that tuning of a liner is accomplished entirely by altering its mass and/or stiffness:

Q. Do you recall how [the liner] was going to be tuned?

A. Stiffness and mass.

Q. Why stiffness and mass?

A. Because that's how you tune the liners.

Q. ***That's how you tune any damper, right***?

A. ***Pretty much, yeah***.

Appx1759 (Sun Tr. 98:14-22); *see also* Appx1751 (Sun Tr. 66:22-67:7).

American Axle's engineering manager, Mr. Glen Steyer, explained that a damper's frequency can "absolutely" be determined with knowledge of its mass and stiffness:

Q. Can you determine the frequency of the ITD [internal tuned damper] with the mass and the stiffness?

A. Absolutely.

> Q. And what's the formula for that?
>
> A. [] The natural frequency squared is equal to K over M, stiffness over mass.

Appx2547 (Steyer Tr. 18:1-7). Mr. Steyer also confirmed that for liners specifically, tuning is accomplished "strictly" by controlling the "stiffness and mass":

> Q. How do you tune a liner by controlling its stiffness?
>
> A. How do you tune a liner? As we described, ***the natural frequency is strictly a function of stiffness and mass***, so if I do something to control the stiffness, then I am directly controlling the tuning.
>
> Q. And that's governed by that function, square root of K over M?
>
> A. That's correct.

Id. at 20:20-21:5.

Mr. Michael Voight, American Axle's Senior Manager of propshaft design and an engineer with American Axle since its formation in 1994 (Appx4972-4973 (Voight Tr. 8:17-12:14)), also confirmed that the addition of any mass into the propshaft will affect the frequency. Appx4986 (Voight Tr. 65:2-12). He knew that because he knew Hooke's Law: "[I]f you recall, the frequency [of a liner] is the square root of k over m, so when you change…the mass, you change the frequency." *Id.*

The natural relationship defined by Hooke's law holds true even for systems having more than one degree of freedom; that is, when the oscillations occur along

different axes (bending mode, torsion mode, and shell mode). As Dr. Sun testified, the '911 patent's "tunable liner can be mathematically simplified as a single degree of freedom mass-spring-damper system" for attenuating each mode of vibration. *See* Appx1772-1773 (Sun Tr. 153:21-154:12.) He explained, "a tunable liner theoretically or mathematically can be simplified as just single degree of freedoms of mass spring systems…That means you look at the bending, you look at the torsion, and there will be multiple tunings that you put it in, but if you break them down, they're all a combination of a single degree freedoms." *Id.* at Appx1773.

American Axle's documents confirm that a "tunable liner can be mathematically simplified as a single degree of freedom mass-spring-damper system." Appx3189-3203 at Appx3196.

American Axle's internal documents also confirm that "tuning" of liners is accomplished by adjusting the mass and stiffness to change frequency:

> With the increase of interference fit, the ***stiffness*** of the liner increases ***which causes the increase of the frequency***.

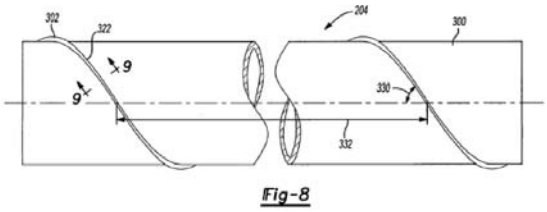
Id. at Appx3198.

> As expected, results showed that the mass of liner has significant impact on the tuning frequency – ***larger mass produces lower liner tuning frequencies***.

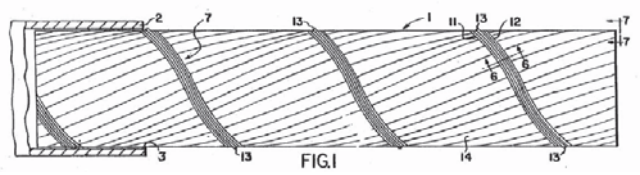
Id. at Appx3199.

F. The Asserted Patent Does Not Disclose Any Method For The Construction Of A Cardboard Liner, But Rather Relies On The Prior Art

The '911 patent does not disclose any method of constructing a liner. Instead, it incorporates by reference the prior art '361 patent (discussed above). Appx32, 6:49-53. The '911 patent then states that the disclosed liner "can be constructed in a manner that is similar to that which is described in U.S. Pat. No. 4,909,361." *Id.* Accordingly, the cardboard liner shown in Figure 8 of the '911 Patent is substantively identical to the cardboard liner shown in Figure 1 of the '361 Patent:



Appx27, '911 Patent, Fig. 8



Appx1281, '361 Patent, Fig. 1

See also Appx1557-1558 (Becker Rep. ¶ 63).

Notably, the assignee of the '361 Patent is Arrow Paper Products Company—now Caraustar Industries, Inc.—the manufacturer of both American Axle's liners and Neapco's liners. Appx1280; Appx1294 (Wehner Tr. 31:1-13); Appx1755-1756 (Sun Tr. 85:15-86:22).

Moreover, the '911 patent discloses several examples of liners having physical properties (supposedly tuned according to the patented invention). Appx33, 8:2-23, Appx28-29, Figs 10-14. For example, the liner described in column 8 of the

patent is defined by its "outer diameter," its "length," its "mass," its material, its "wall thickness," its "inner diameter," the "helix angle" and structure and material of a "resilient member" coupled to the liner, and the way it is inserted into the propshaft. *Id.* at Appx33. The specification does not disclose how the inventors obtained those specific structures other than that the generic concept of "tuning" was utilized. *See id.* No such structure, and no methodology to achieve such structure, is found in any of the asserted claims.

II. The District Court Faithfully Applied The *Mayo* Framework, Finding The Asserted Claims Directed To A Patent-Ineligible Law of Nature

After voluminous briefing and oral argument, *see* Appx4, the district court ruled that the asserted claims "are invalid under § 101, as they are directed to nonpatentable subject matter." Appx18.

In doing so, the district court correctly recited and properly applied the two-step framework set forth in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012) and *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014). It also acknowledged and followed this Court's recent Section 101 jurisprudence. Appx9-10.

At step one, the district court found that the asserted claims "as a whole are directed to laws of nature: Hooke's law and friction damping." Appx10. It observed that "[t]here is no dispute that adjusting the mass and stiffness of the liner will change

the amount of damping of a certain frequency." Appx11. As a result, "[t]he claimed methods are applications of Hooke's law with the result of friction damping." *Id.*

It rejected American Axle's attempts to recast its claims into something altogether different—a complex "industrial process"—finding that "the Asserted Claims do not disclose a method of manufacturing a propshaft; instead, considered as a whole, they are directed to the mere application of Hooke's law[.]" *Id.* It remarked that the claims "fail to instruct ***how*** to design the tuned liners or manufacture the driveline system to attenuate vibrations"—an observation that is just as true of the claims as it is of the entire specification. Appx11-12 (original emphasis).

At step two, the district court searched for an inventive concept, but came up empty. It found that, "as the '911 patent itself explains, the method of manufacturing a shaft assembly of a driveline system by inserting a liner into the propshaft was well-known in the prior art." Appx14. Beyond this routine and conventional activity, the district court found that the claims were left with a direction to abstractly "appl[y] Hooke's law" by controlling the liner's mass and stiffness to reach a desired frequency. Appx15. It explained: "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 ("NVH")

engineer…consider the law of nature when designing propshaft liners to attenuate driveline vibrations." *Id.*

As to the final limitations of each of the claims, the district court found that those were part and parcel of the "tuning" limitations, since they were merely "the result that is achieved from performing the method rather than an active step in the method." Appx15-16.

As a useful double-check of its two-step analysis, the district court followed this Court's recent guidance in *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350 (2016). Appx16. Quoting this Court, the district court analyzed whether the claims recited anything about "how the desired result is achieved" as opposed to merely identifying that desired result—"'there is a critical difference between patenting a particular concrete solution to a problem and attempting to patent the abstract idea of a solution to the problem in general.'" Appx16-17. With this guidance, the district court held that "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." Appx17.

The district court also considered and rejected American Axle's assertions that the claims are patentable under a separate "preemption" test, or using the "machine-or-transformation" test. Appx17-18. Neither analysis could change that

"the Asserted Claims are nothing more than applying a law of nature to a conventional method to achieve an abstract solution to a problem" and thus "fail to provide any meaningful limits on the scope of the claim." *Id.* at Appx18.

SUMMARY OF THE ARGUMENT

The district court properly granted summary judgment that the asserted claims recite unpatentable subject matter. In applying the Supreme Court's two-part test, the district court correctly concluded that the asserted claims do nothing more than recite the abstract concept of "tuning" a liner according to a natural law. And it rightly found no inventive concept, finding no genuine dispute that the remaining claim elements—providing a propshaft and inserting a liner into it—were merely well-known, conventional activity. Because the asserted claims seek to monopolize this basic principle of physics—tuning according to Hooke's law—the district court properly held the claims invalid under 35 U.S.C. § 101.

The court's conclusion likewise follows from the double-"check" analysis set forth in *Electric Power Group*, which recognizes that claims that merely recite a desirable result, and not a particular means of achieving that result, are unpatentable. *See* 830 F.3d at 1356. That is precisely these claims. American Axle recites a result-oriented abstract idea—tuning a liner—to achieve a goal-oriented result—attenuating vibration modes. And it does so by covering any and all applications of that solution; it fails to recite any particular liner or particular method of

manufacturing such a liner. That exquisite breadth is another symptom of the claims' failure to recite patentable subject matter.

The judgment below should be affirmed.

ARGUMENT

I. Standard of Review

This Court reviews a grant of summary judgment under the law of the regional circuit. *Intellectual Venture I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1337 (Fed. Cir. 2017). The Third Circuit "'review[s] an award of summary judgment de novo, applying the same test on review that the District Court should have applied.'" *Steele v. Cicchi*, 855 F.3d 494, 500 (3d Cir. 2017) (internal citation omitted). "The ultimate question of patent eligibility under [35 U.S.C.] § 101 is an issue of law, reviewed de novo." *In re BRCA1- and BRCA2- Based Hereditary Cancer Test Patent Litig.*, 774 F.3d 755, 759 (Fed. Cir. 2014).

American Axle asserts that its patent is entitled to a presumption of validity (AAM Br. at 28), but the law appears to be unsettled about whether such a presumption attaches during a review of patent subject matter eligibility. *See, e.g.*, *Ultramerical, Inc. v. Hulu, LLC*, 772 F.3d 709, 721 (Fed. Cir. 2014) (Mayer, J., concurring) ("The reasonable inference, therefore, is that while a presumption of validity attaches in many contexts, [] no equivalent presumption of eligibility applies in the section 101 calculus.") (internal citation omitted). Resolution of that issue is

immaterial to this appeal, however, given that the claims fail to satisfy § 101 even under a heightened standard, as set forth below.

II. American Axle's Claims Do Not Recite Patentable Subject Matter

Section 101 of the Patent Act defines patent eligible material as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. But § 101 "contains an important implicit exception: 'Laws of nature, natural phenomena, and abstract ideas' are not patentable." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012) (internal citations omitted); *Alice Corp. Pty. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014).

In *Mayo* and *Alice*, the Supreme Court outlined a two-part test for determining patent eligibility. First, the Court must determine whether the claim is "directed to a patent-ineligible concept." *Alice*, 134 S. Ct. at 2355. If so, the Court must then "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Id*. (quoting *Mayo*, 566 U.S. at 78-79). Step two is thus a "search for an 'inventive concept.'" *Id*.

A. At Step One, The Asserted Claims Are Directed To An Unpatentable Law Of Nature (Hooke's Law) And An Abstract Concept (The Undefined Use Of Hooke's Law)

The claims at issue on appeal may very well have been designated "method[s] of manufacturing," but they are only so in name, not substance. When viewing the actual claim language, the "method" boils down to no more than the most generic of conventional steps coupled to the abstract concept of "tuning," which itself is the mere recognition of the natural relationship between an object's mass, stiffness, and frequency (known as Hooke's Law). There is nothing that can, even under the most generous of labels, be considered a true "manufacturing" step, let alone an entire "industrial process."

In claim 22, for example, one step is "providing a hollow shaft member," i.e., the propshaft, and another is "inserting" a "liner into the shaft member." Appx35. Arranging one generic component inside another is hardly the type of "industrial process" that American Axle asserts it to be. What remains in the claim is the concept of "tuning": "tuning a mass and a stiffness of at least one liner," "wherein the at least one liner" is tuned to attenuate certain vibration modes. Appx35. As the district court rightly concluded, the "wherein" claims add nothing to the claimed method other than reciting the desired "result that is achieved from performing the method rather than an active step in the method." Appx15-16.

The direction to "tun[e] a mass and a stiffness" of a liner is, of course, a mere recitation of a natural law—Hooke's law—which says that an object's mass (m) and stiffness (k) are related to its frequency (f_n) according to the following equation: $f_n = (k/m)^{\wedge 0.5}$. The claim language is thus a statement of that physical relationship, one that necessarily exists in nature, and that was long ago deduced from scientific observations of natural phenomena. Other 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. They do not recite any specific steps to achieve such "tuning" (other than identifying the natural relationship between frequency, mass, and stiffness), let alone anything that could be considered novel or inventive.

The district court, having presided over this case from the outset, including claim construction, was correct to conclude that the asserted claims boil down to "merely appl[ying] Hooke's law and then measur[ing] the amount of damping." Appx11. The district court agreed with Neapco that the claims simply "apply (or just characterize) the physics behind 'tuning' and vibration attenuation or damping." *Id.*

That conclusion is the only one that follows from the evidence in this case. When asked to characterize the '911 patent, Dr. Sun, American Axle's corporate witness and a named inventor, conceded that the claims are merely directed to "tuning": "Q. And the '911 patent relates to tuned liners, is that correct? A. Correct.

Q. And those tuned liners can be tuned to different types of vibration, is that correct? A. Yeah, that's why – yep. ***That's what this is for, for tuning.***" Appx1779 (Sun Tr. 179:2-8). And "tuning"—that is, adjusting the liner's mass and/or stiffness to alter its frequency—as Dr. Sun further admitted, is just "basic physics." Appx1757 (Sun Tr. 92:15-93:2). Adjusting "[s]tiffness and mass," as Dr. Sun testified, is "how you tune the liners"; "[t]hat's how you tune ***any*** damper." Appx1759 (Sun Tr. 98:17-22).

As such, the district court was also correct to conclude that there could be no factual dispute over whether the claims are directed to a natural law. It found, based on the underlying record evidence and the patent itself, that American Axle "does not dispute that Hooke's law is the linear relationship between force *F* and displacement *x* of a spring with stiffness *k*," "does not dispute that the frequency is affected by a change in mass *m* or stiffness *k*," and that "friction damping…is a property of physics experienced by any two surfaces in contact." Appx10-11.

American Axle does not seriously dispute that the claims recite and depend upon the natural relationship between the liner's mass, stiffness, and frequency. Rather, American Axle argues that the claims are not "directed to" Hooke's law because the claims do not use the words *Hooke's law* or the precise equation $f_n = (k/m)^{\wedge 0.5}$. (AAM Br. at 47 (citing *Mayo*, and arguing that "decisions finding claims

directed to patent ineligible laws of nature at step one have involved a recitation of the law of nature itself").)

That's wrong. *Mayo*'s claims did not recite any precise equations or identify the name of the precise law of nature; it simply recited the natural "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." 566 U.S. at 77. "The relation is a consequence of the ways in which thiopurine compounds are metabolized by the body—entirely natural processes." *Id.* That is exactly what is going on here. The asserted claims expressly recite the "relationship" between an object's physical properties with an instruction to modify certain of them (mass, stiffness) in order to effect another (frequency).

In any event, it would exalt form over substance if step one of the *Mayo* test could be sidestepped so easily by reciting the relationship in a natural law without using the law's name or the full express equation. *Mayo* and *Alice* designed their two-part inquiry precisely to avoid such an easily manipulate-able result, and one that would "depend 'simply on the draftsman's art.'" *Mayo*, 566 U.S. at 72 (internal citations omitted) (warning against interpreting § 101 "in ways that make patent eligibility 'depend simply on the draftsman's art'"); *Alice*, 134 S. Ct. at 2359 (same); *Parker v. Flook*, 437 U.S. 584, 590 (1978).

American Axle also appears to assert that claims for "methods of manufacturing" and "methods of producing" can never run afoul of the natural law exceptions to patent eligibility. (AAM Br. at 31-32.) No court has ever said that, and of course, that is not the law. Again, were it so simple to avoid § 101, any competent draftsperson could monopolize natural laws and abstract ideas by giving claims the right label and enough window-dressing to characterize them as such. *See Mayo*, 566 U.S. at 72; *Alice*, 134 S. Ct. at 2359; *Flook*, 437 U.S. at 590. That too is inconsistent with the requisite two-part test, and would likewise elevate form over substance.

American Axle also argues that the claims cover "methods for manufacturing large, metal propshafts that use ***specifically designed*** liners to reduce the amount of vibration" in the propshaft. (AAM Br. at 31; *see id.* at 1, 27, 30 (referring to "specifically designed" and "specifically tuned" liners).) To that end, American Axle points to a detailed demonstrative with images and relationships, trying to make its claim look complex and industrial. *Id.* at 34. It also provides a pie chart graph that it labels "exemplary elements of the asserted claims," including no less than seven key "elements," including "identify relevant propshaft shell mode frequency," "liner match shell mode frequency," and "liner damp shell mode vibration." *Id.* at 40. But American Axle's characterization of the claimed method is far divorced from the actual claim language.

The fact is that the claims do not recite a method for "manufacturing propshafts," other than to say that the claims instruct that a "hollow shaft member" is "provid[ed]." Appx35 (claim 22). And the "exemplary elements" are not elements of the claims at all. Instead, they appear to be unclaimed steps that somehow relate to the claimed method and its requirement to "tune" the liners in an undefined way. The actual claims recite no specific methodology for "tuning;" instead, they purport to cover any and all tuned liners so far as they satisfy the parameters provided in the "wherein" result clause. American Axle may wish to recast its claim for purposes of surviving a § 101 challenge, but this Court is not "in a position to rewrite claims or review a hypothetical claim." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 809 F.3d 1282, 1286 (Fed. Cir. 2015) (Lourie, J., concurring in denial en banc).

American Axle's re-characterization of the claims is much like the patentee's in *Automated Tracking Sols., LLC v. Coca-Cola Co.*, 723 F. App'x 989, 993-94 (Fed. Cir. 2018). There, the patentee argued that its claims "specify a ***particular configuration*** for using" data. *Id.* at 993 (emphasis in original). The "problem" with that argument, however, "d[id] not lie with [the] contention that claims directed to specialized components…should be patent-eligible," but with the patentee's "portrayal of the breadth of the representative claims." *Id.* at 994. Contrary to the patentee's characterization, the Federal Circuit found that "[t]he representative

claims simply do not require a particular configuration or arrangement of…system components." *Id.* Accordingly, reliance on unrecited limitations could not be the basis for patentable eligibility. *See id.* The same is true here. American Axle may refer to its claims as directed to a "specifically designed liner[]" (AAM Br. at 31), but just saying it doesn't make it so.

Indeed, the claims recite the exact opposite of a "specifically designed liner." They recite *any* liner that is "tuned," without regard to how it is tuned, even though the '911 patent explains that "tuning" may be accomplished by controlling dozens of potential characteristics of the liner. *See* Appx33, 7:56-8:3. As American Axle's expert explained, "tuning" can be achieved in the "design," the "manufactur[e]," or the "installation" of a liner. Appx169 (Rahn CC Decl. ¶ 65). That means there are an unlimited number of ways in which to effect "tuning," and an unlimited number of "liners" that could be considered "tuned." These claims effectively swallow *any* tuner design.

As such, American Axle's claims are not only directed to natural laws (Hooke's law and the law of friction damping), but they are also so broad and undefined as to be directed to the general abstract concept of "tuning" a liner.

In *Interval Licensing*, this Court recounted the very earliest cases that ran afoul of the "abstract" concept exception to patentable subject matter. *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1342-44 (Fed. Cir. 2018). It pointed to

Justice Story's opinion in *Wyeth v. Stone*, 30 F. Cas. 723 (C.C.D. Mass. 1840), and to *O'Reilly v. Morse*, 56 U.S. 62 (1853). Both cases involved industrial-type methods claims, one a method for cutting ice, and the other a method for "'printing intelligible characters, letters, or signs, at any distances.'" *Interval Licensing*, 896 F.3d at 1343 (internal citations omitted). But both were held to recite unpatentable subject matter. *See id.* The problem with both was their breadth and abstractness; neither claim set forth any particular process or machinery with how to accomplish the result. *See id.* As this Court explained, "each inventor…lost a claim that encompassed all solutions for achieving a desired result," given that the "claims failed to recite a practical way of applying an underlying idea…[and] instead were drafted in such a result-oriented way that they amounted to encompassing 'the principle in the abstract' no matter how implemented." *Id.*

That is likewise the problem with American Axle's claims. They recite the conventional notion of arranging a propshaft and inserting a liner, and introduce the allegedly novel concept of "tuning" the liner. When asked at the summary judgment oral argument to identify the claims' inventive concept, American Axle's counsel pointed to "[t]uning a liner to target a specific bending mode." Appx7193-7194, 23:10-24:6. On appeal, American Axle repeats the refrain that its claim introduces the alleged novel "concept of tuning a paper or cardboard liner." (AAM Br. at 12; *see also id.* at 15, 25-26.) But, as the district court correctly held, the claims "are

not directed to any specific discrete liner design" and "provide no particular means of how to craft the liner and propshaft" in order to achieve the desired result. Appx16-17. 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." Appx18.

"The 'abstract ideas' category embodies 'the longstanding rule that '[a]n idea of itself is not patentable." *Alice*, 134 S. Ct. at 2355 (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Because they cover the generic *idea* of tuning a liner, rather than any concrete application of that idea, American Axle's claims violate this longstanding rule.

This case is similar to *In re BRCA-1 & BRCA-2-Based Hereditary Cancer Test Patent Litig.*, 774 F.3d 755 (Fed. Cir. 2014). *In re BRCA-1* also involved method claims, which the district court found were directed to natural phenomena—the BRCA1 and BRCA2 genetic sequences—generically applied to conventional techniques. *Id.* at 759. On appeal, however, this Court did not ultimately decide whether the claims were drawn to natural phenomena, as in *Mayo*. *See id.* at 762. Rather, this Court affirmed "because the method claims…suffer from a separate infirmity: they recite abstract ideas." *Id.* The Court pointed to the claims' recitation of "comparing" the BRCA gene sequences to a human tissue sample, and "determining the existence of alterations" as "patent-ineligible abstract idea[s]." *Id.*

at 763. It reasoned: "[t]he number of covered comparisons is unlimited"; they are "not restricted by the purpose of the comparison or the alteration being detected." *Id.* "Because of its breadth, the comparison step covers detection of yet-undiscovered alterations, as well as comparisons for purposes other than detection of cancer." *Id.* at 763-64.

Here, the "tuning" step is just as broad. The number of "tuned" liners is unlimited. The claims cover liners that have yet to be discovered. They cover any and all methods of tuning liners, including an unlimited number of methods of designing, manufacturing, and installing liners. This breadth follows from the claims' attempt to monopolize the abstract idea of "tuning" untethered to any particular tuned liner or method of tuning. But the abstract idea of "tuning" is just as patent ineligible as the natural law that the idea invokes. Either way, the claims do not pass muster under § 101.

B. At Step Two, The Claims Merely Append To The Natural Law and Abstract Idea Conventional Steps Recited At A High Level Of Generality

In *Mayo*, the Supreme Court directed that "simply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable." 566 U.S. at 82. Thus, "when a patented process amounts to no more than an instruction

to 'apply the natural law,'" it is ineligible for patent protection. *Id.* at 1301. Yet that is what American Axle's claims do here.

1. The Claims Recite The Natural Law For Tuning And An Instruction To "Apply It"

The asserted claims lack an inventive concept at *Alice* Step Two for the same reasons as the claims in the Supreme Court's *Mayo* decision: they simply identify the relationship between mass, stiffness, and natural frequency (Hooke's Law) with the instruction "apply it" (or "configure it"). Everything else in the claims is routine and conventional, and specified at a high level of generality.

There simply can be no genuine dispute that what remains of the claims absent the abstract idea to "tune" the liners according to Hooke's law, was conventional activity long-practiced by those skilled in the art. As the district court correctly found (Appx14), the '911 patent's own description of the prior art fully resolves the issue. The background of the invention describes numerous patents, some decades old, which use cardboard liners with rubber winding inside of propshafts to reduce vibration. Appx30, 1:38-39; 2:23-38. Were that not enough, the record contains indisputable evidence that Neapco's predecessor, Visteon, had been using press-fit cardboard liners in its propshafts continuously since the early 1990s on multiple different vehicle models. Appx1293, 27:24-29:16; Appx1325, 156:19-21; Appx1326, 159:24-160:4; Appx1401-1403 (Becker Rep. ¶¶ 32-35).

Thus, the patent's method steps, taken individually and in combination as an ordered whole, simply recite well-known, conventional activity: "providing a hollow shaft member," and "inserting [a] liner into the shaft member." Appx35. To this, the claims add only the concept of "tuning a mass and stiffness of at least one liner," and a "wherein" clause that describes the desired amount of vibration damping as a result of the tuning. *Id.*; Appx15-16 ("In the Court's view, [the wherein] claim limitation is, instead, the result that is achieved from performing the method rather than an active step in the method.").

Taken as a whole, the claims simply tell one of skill to "tune"—according to the natural relationship between an object's mass, stiffness, and frequency—an otherwise conventional liner used in an otherwise conventional propshaft to attenuate vibration. But this type of "apply it" instruction is not enough to "transform an unpatentable law of nature into a patent-eligible application of such a law." *Mayo*, 566 U.S. at 72; *see also Alice*, 134 S. Ct. at 2360.

Mayo is informative. There, the method claim consisted of three general steps: an "administering" step, a "determining" step, and a "wherein" step. *Id.* at 74-75, 78. The "administering" step referred to the audience (doctors) who treat patients with thiopurine drugs. *Id.* at 78. The "determining" step instructed the doctor to determine, through any process, the level of relevant metabolites in the blood. *Id.* And the "wherein" steps informed the doctor of the relevant natural laws,

and suggested that she consider those laws when treating her patient. *Id.* Put simply, "these [wherein] clauses tell the relevant audience about the laws while trusting them to use those laws appropriately where they are relevant to their decisionmaking." *Id.*

The asserted claims here are similar: they simply tell the engineer or designer about the law of nature (that adjusting mass and stiffness controls frequency) and then instruct her to consider those two variables when designing, manufacturing, and/or installing the liner. This is the same flaw as the claims in *Mayo*, and indeed, is "rather like Einstein telling linear accelerator operators about his basic law and then trusting them to use it where relevant." *Id.*

American Axle argues only that it was previously unknown to tune liners to attenuate bending mode vibrations—a point that Neapco disputes and the record evidence contradicts. (*E.g.*, AAM Br. at 58-60.) But for purposes of this appeal, assuming American Axle is correct, it still cannot be an "inventive concept" to take a known law of nature and, without more, claim a generic "application" of that natural law in a particularized field. Quite simply, "a claim for a ***new*** abstract idea is still an abstract idea." *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) (emphasis in original).

Mayo's robust discussion helps guides the analysis here. *Mayo* observed that Einstein could not have patented his famous equation $E=mc^2$ by claiming a process consisting of telling linear accelerator operators to refer to the law to determine the

relationship between energy and mass. *Mayo*, 566 U.S. at 78. Likewise, it explained that Archimedes could not secure a patent for his famous principle of buoyancy/flotation by claiming a process or method of telling builders to refer to that principle to determine whether an object will float. *Id.* Both discoveries were, of course, groundbreaking, but as *Mayo* makes clear, the discoveries themselves, as well as the mere instruction to apply those discoveries in some particular application, are unpatentable. *See id.*

In much the same way, the asserted claims here are unpatentable. They instruct an engineer to take the prior art liner (which already attenuated shell mode vibration) and adjust the mass and stiffness of the liner (i.e., apply Hooke's Law) to tune the liner to also attenuate bending mode vibrations. The district court held as much, finding that "the 'tuning' claim limitation does nothing more than suggest that a noise, vibration, and harshness ("NVH") engineer…consider that law of nature [Hooke's law] when designing propshaft liners to attenuate driveline vibrations." Appx15.

American Axle invokes the Supreme Court's decision in *Diamond v. Diehr*, 450 U.S. 175 (1981), but far from undermining it, *Diehr* only further supports the district court's determination. Indeed, the bare-bone claims here are entirely unlike those held patentable in *Diehr*. Just as here, the claims in *Diehr* recited a law of nature, the Arrhenius equation. *See id.* But that's where the similarity ends. The

rest of the *Diehr* claim recited a "step-by-step method for" curing synthetic rubber, "beginning with the loading of a mold with raw, uncured rubber and ending with the eventual opening of the press at the conclusion of the cure." *Id.* at 184. Among many others, those steps "include[d] installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time." *Id.* at 187.

Of the ten recited method steps in the *Diehr* claim, only one recited the Arrhenius equation; the rest are specific steps of performance to transform uncured rubber into a "precision molded and cured rubber article." *Id.* at 179 n.5. By sharp contrast, when the "tuning" step and the resulting "wherein" language are removed, the asserted claims of the '911 patent are left with only two generic steps recited at a high level of generality: "providing a hollow shaft member," and "inserting the at least one liner into the shaft member."

Ultimately, the *Diehr* claims as a whole recite a specific, defined methodology for curing rubber, with a recitation of specific, detailed steps starting at the beginning of the process, and concluding with an end-result. As a result, they possess what the 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).

Finally, American Axle variously invokes the district court's claim construction as somehow adding significant, transformative claim requirements that are otherwise not explicitly stated. (AAM Br. at 52-53, 55.) But the claim construction order does not help. None of the constructions add limitations about how to specifically tune a liner, or about the physical characteristics of what a specifically tuned liner looks like. The constructions provide more generic information about the goal: for example, a liner "having characteristics configured to match a relevant frequency or frequencies." Appx1047.

There is thus no "inventive concept," and the district court correctly held the asserted claims unpatentable under § 101.

2. Limiting The Natural Law To A Particular Technological Environment Does Not Confer Patent Eligibility

American Axle also contends that it was the first to "tune" liners to attenuate certain vibration modes, and that its recognition of that idea constitutes an inventive concept. (AAM Br. at 57-58; *see also* Appx7193-7194 (SJ Hearing Tr. 23:10-24:6 (arguing that the inventive concept is "[t]uning a liner to target a specific bending mode")).)

But that is no more than claiming the natural law as limited to a particular technological environment, something this Court and the Supreme Court have repeatedly said is not good enough. *Electric Power*, 830 F.3d at 1354 ("Most obviously, limiting the claims to the particular technological environment of power-

grid monitoring is, without more, insufficient to transform them into patent-eligible applications of the abstract idea at their core."); *see also Alice*, 134 S. Ct. at 2358; *Bilski v. Kappos*, 561 U.S. 593, 610-11 (2010) ("*Flook* stands for the proposition that the prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of [the idea] to a particular technological environment.'") (internal citations omitted). In other words, even if American Axle were the first to recognize that Hooke's law could be used in the design of propshaft liners, it cannot obtain a claim on the mere abstract idea of "tuning" liners without more.

Parker v. Flook, 437 U.S. 584 (1978), is directly on point. The *Flook* claims recited "a method of updating alarm limits" for monitoring "catalytic conversion processes." *Id.* at 585. There were three steps: "an initial step which merely measures the present value of the process variable (*e.g.*, the temperature); an intermediate step which uses an algorithm to calculate an updated alarm-limit value; and a final step in which the actual alarm limit is adjusted to the updated value." *Id.* But "[t]he only difference between the conventional methods of changing alarm limits and that described in [the claim] rests in the second step—the mathematical algorithm or formula." *Id.* at 585-86.

Just as American Axle does here, the patent applicant in *Flook* argued that the claims did not entirely preempt the use of the mathematical formula, as it was limited

to the particular industry and use recited in the claims. The Court rejected that argument, explaining:

> The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques. The concept of patentable subject matter under § 101 is not "like a nose of wax which may be turned and twisted in any direction . . . ."

Id. at 590 (internal citation omitted).

Just as the claims at issue here, the claims in *Flook* failed to set forth much information, if any, about how to actually achieve the desired result. As the Supreme Court observed:

> The patent application does not purport to explain how to select the appropriate margin of safety, the weighting factor, or any of the other variables. Nor does it purport to contain any disclosure relating to the chemical processes at work, the monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system. All that it provides is a formula for computing an updated alarm limit.

Id. at 586. So too here. American Axle's claims fail to provide any information about *how* to tune the liners to achieve the claimed desired result of attenuating

damping; they merely tell one to tune the liners by applying Hooke's law (adjusting the liner's mass and/or stiffness) in some unexplained way.

Ultimately, it is simply not enough for a claim merely to identify a useful application or purpose for which to put to use a law of nature, as was the case in *Flook*, and as is the case here. *Flook* controls the outcome here.

3. Neither Finite Element Analysis (FEA) Modeling nor Experimental Modal Analysis Are Even Claimed, Let Alone Constitute an Inventive Concept

American Axle argues that cardboard liners are "complex" or "complicated" objects such that their behavior is "far removed" from Hooke's Law. (AAM Br. at 19, 39.) Because of this supposed complexity, American Axle argues that liners are actually designed using iterations of Hooke's Law on a computer (FEA modeling) or iterations of Hooke's Law with physical testing (experimental modal analysis). (AAM Br. at 8-11, 20-22.) All of that complexity, according to American Axle, proves that the claims are more than the mere generic application of a natural law. American Axle is mistaken.

As an initial matter, nowhere in the '911 Patent are sophisticated FEA models or experimental modal analysis (or the need to use them) disclosed. And they are certainly not claimed. American Axle's focus on that activity is therefore misplaced.

In addition, American Axle admits that "measuring" frequency of a liner and a propshaft is not inventive, but rather was known in the art. (AAM Br. at 8 ("The

methods for determining natural frequencies and damping are well known in the art.").)

Moreover, American Axle's purported use of FEA modeling does not change the outcome here because, as American Axle concedes, its FEA computer models employ Hooke's Law: "sophisticated computer models, often called finite element analysis ("FEA") models, may employ Hooke's law to model vibration." (AAM Br. at 20.) And Dr. Sun explained that American Axle uses "very sophisticated FEA models," employing Hooke's Law, to model vibration of the liners. *Id.*; *see also* Appx1752 (Sun Tr. 72:2-6).

Further removing any potential dispute of fact, Dr. Sun conceded that tuning a liner simply comes down to applying Hooke's law. He stated that a "tunable liner can be mathematically simplified as a single degree of freedom mass-spring-damper system" for attenuating bending mode vibrations. Appx1772-1773 (Sun Tr. 153:21-154:12.) He explained, "a tunable liner theoretically or mathematically can be simplified as just single degree of freedoms of mass spring systems…That means you look at the bending, you look at the torsion, and there will be multiple tunings that you put it in, but ***if you break them down, they're all combination of a single degree freedoms***." *Id.* American Axle's contention on appeal directly contradicts this binding testimony, and thus cannot create a genuine dispute of material fact.

As for experimental modal analysis, American Axle suggests that experimental modal analysis is wholly independent of Hooke's Law, and that engineers use only the former to "tune" liners. (AAM Br. at 46.) But experimental modal analysis is simply a physical testing mechanism used to determine the natural frequencies of the propshafts and liners. (AAM Br. at 8 ("Like American Axle, Neapco and others in the automotive industry test for natural frequencies and damping of propshafts by performing experimental modal analysis."); 9 ("Experimental modal analysis is also used to determine natural frequencies of vibration absorbers, such as liners.").) Thus, even if this physical testing is used to determine a liner's natural frequency (as opposed to calculating it by hand with Hooke's Law, or modeling Hooke's Law on a computer), to "match" it to the propshaft frequency, its mass and stiffness are adjusted—*which is just the application of Hooke's Law*. More fundamentally, how one measures a liner's or propshaft's natural frequency has nothing to do with how one tunes the liner to achieve a given frequency. It is the latter that is invoked by the claim's "tuning" limitation; the claims do not recite a method of measuring frequency.

Ultimately, the alleged complexity of the methodology needed to precisely tune a liner to achieve the results set forth in the claims only underscores the claims' invalidity. If the claims were something more than stating an abstract idea for achieving a desired result, then they would necessarily need to recite the FEA

modeling and experimental modal analysis that American Axle now says is necessary.

4. There Are No Disputed Facts And Summary Judgment Was Proper

Citing this Court's *Berkheimer v. HP Inc.* decision, American Axle asserts that there are genuine disputes of fact over which summary judgment should not have been awarded. American Axle claims that the district court blithely considered this question, having "summarily concluded in a footnote" that there were no fact disputes. (AAM Br. at 66 (citing *Berkheimer v. HP Inc.*, 881 F.3d 1360 (Fed. Cir. 2018)).) This argument is based on a misreading of the district court's opinion and its careful analysis of the dispositive concessions of American Axle's witness and the prior art.

Contrary to American Axle's assertion on appeal, the district court correctly found that there can be no genuine dispute of material fact that the steps of the asserted claims, over and above the natural law, were well-understood, routine, and conventional. Appx14. According to the district court, that finding was based mainly on what the "'911 patent itself explains,"—that "the method of manufacturing a shaft assembly of a driveline system by inserting a liner into the propshaft was well-known in the prior art." *Id.* It was also based on the admissions of American Axle's corporate witness and named inventor, Dr. Sun, as discussed and quoted above. *Supra*, § I.E.

In view of the admitted prior art in the '911 patent, and the concessions of American Axle's corporate witness, the district court was correct to conclude that there is no genuine issue of material fact, such that summary judgment was proper. American Axle points to the seemingly contrary testimony of its retained expert, Dr. Rahn, but "[b]road conclusory statements offered by [American Axle's] experts are not evidence and are not sufficient to establish a genuine issue of material fact." *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1329 (Fed. Cir. 2001). Moreover, Dr. Rahn admitted that he never designed any automotive component for a commercial vehicle, nor has he designed a propshaft or damping device for a propshaft. Appx2482 (Rahn Tr. 44:17-45:10); Appx2511 (Rahn Tr. 161:11-20). In any event, Dr. Rahn conceded that it is Dr. Sun, the inventor, who is the true expert here. Appx6814 (Rahn Tr. 84:6-85:4).

C. As A Check On The Two-Step Analysis, The Claims Impermissibly Attempt To Patent A Desirable Result Rather Than Any Specific Means Of Achieving That Result

In *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1356 (Fed. Cir. 2016), this Court articulated a useful "check" for the second step of the *Mayo/Alice* inquiry. Noting the "important common-sense distinction between ends sought and particular means of achieving them," this Court explained that "the essentially result-focused, functional character of claim language has been a frequent feature of claims held eligible under § 101." *Id.*

In *Electric Power*, the asserted claims covered every potential solution to the problem of effectively monitoring multiple sources on a power grid, rather than any particular configuration. *See id.* The Court observed the "common-sense distinction" between "ends sought and particular means of achieving them," and between "desired results (functions) and particular ways of achieving (performing) them." *Id.* "'[T]here is a critical difference between patenting a particular concrete solution to a problem and attempting to patent the abstract idea of a solution to the problem in general.'" *Id.* (quoting district court's decision.)

It concluded by noting that "claims so result-focused, so functional, as to effectively cover any solution to an identified problem" are unlikely to recite patentable subject matter. *See id.* Indeed, looking at claims from that perspective, this Court explained, "is one helpful way of double-checking the application of the Supreme Court's framework to particular claims." *Id.*; *see also Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335 (Fed. Cir. 2018).

As set forth above, the asserted claims here recite the abstract idea of "tuning" a conventional liner to solve the (known) problem of propshaft vibration. The claims list only the abstract solution and the desired results; they do not recite any concrete method or any concrete structure for achieving that solution. Any and all liners, no matter what their physical characteristics, and no matter how they were designed and manufactured, would satisfy the claims so long as they are "tuned" in some

unspecified way to achieve the desired result specified in the claims' "wherein" clause.

The specification serves to underscore just how broad the claims reach. It provides that "tuning" can be accomplished through a large range of different "characteristics," each of which will alter the liner's mass and/or stiffness:

> It will also be appreciated from this disclosure that various characteristics of the liner 204 can be controlled to tune its damping properties in the shell mode and in one or both of the bending mode and the torsion mode. In the particular example provided, the following variables were controlled: mass, length and outer diameter of the liner 204, diameter and wall thickness of the structural portion 300, material of which the structural portion 300 was fabricated, the quantity of the resilient members 302, the material of which the resilient members 302 was fabricated, the helix angle 330 and pitch 332 with which the resilient members 302 are fixed to the structural portion 300, the configuration of the lip member(s) 322 of the resilient member 302, and the location of the liners 204 within the shaft member 200.

Appx33, 7:56-8:2. But the '911 patent simply references these "characteristics," without teaching how each of them affects tuning or damping results. Nor is there anything purportedly novel about modifying any of these well-known characteristics, all of which have long been within the skill of those in the art. Thus, the claimed "tuning" step covers a near-infinite number of possibilities of a "tuned" liner, and a near-infinite number of possibilities of how to manufacture a "tuned" liner. And because the claim merely recites the abstract concept of "tuning," it

would require undue trial-and-error experimentation, haphazardly adjusting numerous "characteristics," to even know if those efforts were successful. That is hardly the type of concrete application of a natural law that passes muster under § 101.

As a result, *Electric Power*'s "useful check" confirms what the Supreme Court's two-part test already reveals: that the asserted claims do not recite patentable subject matter.

The sheer unlimited breadth of the claims is evident in American Axle's infringement allegations. Indeed, in the district court, American Axle argued that *any* liner matching bending mode frequency by 20% and damping shell mode by 2% would infringe—regardless of whether or not it was "specifically tuned:"

> Mr. Nuttall: If you make a liner that achieves these results that's within 20 percent of a bending mode frequency and damp shell mode by 2 percent, then that is an infringing product.
>
> The Court: Even if you didn't try to and didn't know you did it.
>
> Mr. Nuttall: Exactly, Your Honor.

Appx699 (CC Hearing Tr. 58:19-25); *see also* Appx679, 38:12-24.

And American Axle's entire infringement case rested on its assertion that if a liner dampened both shell and bending mode vibrations, it infringed, regardless of whether it was "specifically tuned" or "specifically designed." *See, e.g.*, Appx3463-

3474; Appx5237-5240; Appx6106-6109; Appx6188-6192; Appx7051 (summary judgment briefing).

American Axle's broad infringement theory also undermines its argument on appeal that the claims specifically require the active steps of measuring the liner's frequency, measuring the propshaft's frequency, comparing the two, and repeating that process in iterations until achieving the desired amount of vibration attenuation. (*See, e.g.*, AAM Br. at 39-40 (arguing the claims require the affirmative step of "matching frequencies between multiple different objects").) No such "matching" is required if, as American Axle argued, infringement can occur by use of a liner "[e]ven if you didn't try to [tune] and didn't know you did it." Appx699 (CC Hearing Tr. 58:19-25). American Axle's attempt to narrow the claims to save them from an invalidity challenge is impermissible.

Without specifically saying why, American Axle argues that the district court's reference to *Electric Power* was "misplaced and contrary to the Supreme Court's cautions." (AAM Br. at 54.) That is plainly wrong. *Electric Power* did not seek to circumvent or rewrite the Supreme Court's test for subject matter eligibility; it merely observed a pattern that serves as a "useful check" on the analysis. *See* 830 F.3d at 1356. That is precisely how the district court used that decision here. It went through and properly applied the Supreme Court two-step analysis, and then, only after it held that the claims failed to satisfy that standard, did it look at the *Electric*

Power criteria and "check" its work. *See* Appx16-17. There is nothing legally or factually improper about that.

American Axle cites to *Trading Techs. Int'l, Inc. v. CQG, Inc.* in an attempt to distinguish *Electric Power*, but its efforts are unavailing. (*See* AAM Br. at 65 n.5; 675 F. App'x 1001 (Fed. Cir. 2017) (nonprecedential).) Unlike here, in *Trading Techs.*, the district court found that the asserted claims had "specific structure and concordant functionality of the graphical user interface" that provided an "inventive concept" removed from abstract ideas. 675 F. App'x at 1004. The district court specifically distinguished claims directed to nothing more than "conventional computer implementations of known procedures." *Id.* Because the asserted claims fell into the former category, the criteria of *Alice* Step Two were met. *See id.* On appeal, this Court explained that the district court's rulings tracked precedent, which "has recognized that ***specific technologic modifications*** to solve a problem or improve the functioning of a known system generally produce patent-eligible subject matter." *Id.* at 1004-05.

The claims therefore do not recite an "inventive concept" beyond the natural law (Hooke's law) or the abstract idea (apply Hooke's law in an undefined way) to which the claims are directed. The district court's judgment should thus be affirmed.

III. American Axle's Scattershot Arguments Are Without Merit

A. The District Court Applied The Proper Legal Standard

1. The District Court Did Not Substitute Novelty Or Obviousness Analyses For The Subject Matter Eligibility Analysis

American Axle argues that "the Supreme Court has repeatedly cautioned that inquiries under § 112 (or §§ 102 or 103) are ***not relevant*** to the § 101 inquiry." (AAM Br. at 54.) That is not correct. The *Mayo* language American Axle quotes stands only for the unremarkable proposition that §§ 102, 103, or 112 inquiries should not be ***substituted*** for the § 101 inquiry, as the U.S. Government had urged as amicus curiae in that case. *Id.*; *cf. Mayo*, 566 U.S. at 90. But it does not follow that because these criteria are not to be substituted, that they are wholly irrelevant. Indeed, *Mayo* specifically noted that "in evaluating the significance of additional steps, the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap." *Id.* And this Court has repeatedly acknowledged the common overlap between eligibility and other validity considerations:

> [T]he public interest in innovative advance is best served when close questions of eligibility are considered along with the understanding flowing from review of the patentability criteria of novelty [§ 102], unobviousness [§ 103], and enablement [§ 112], for when these classical criteria are evaluated, the issue of subject matter eligibility is placed in the context of the patent-based incentive to technologic progress.

Trading Techs. Int'l, Inc. v. CQG, Inc., 675 F. App'x 1001, 1005-06 (Fed. Cir. 2017); *cf.* AAM Br. at 65 n.5.

The district court did not apply "an erroneous legal standard," as American Axle argues. (AAM Br. at 54.) It could, and properly did, consider other considerations that may also be relevant to other invalidity doctrines in determining that the asserted claims fail to claim eligible subject matter. But by no means did it "substitute" a different legal doctrine for what is required by the two-part test.

2. Preemption Is Not A Separate Test

When claims are found ineligible under the *Mayo* two-part framework, as they are here, "preemption concerns are fully addressed and made moot." Appx17 (quoting *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015)). That is, the framework necessarily and implicitly deals with preemption. Despite that clear guidance, American Axle asserts that there is a separate "preemption" analysis that the district court improperly "side-stepp[ed]." (AAM Br. at 67-69.)

American Axle is wrong. Both the Supreme Court and this Court have made clear that while preemption is the concern that drives the exceptions to patentability under 35 U.S.C. § 101, "questions on preemption ***are inherent in and resolved by*** the § 101 analysis" set forth in *Alice* and *Mayo*. *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015). That is, "[w]here a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo*

[two-part] framework . . . preemption concerns are fully addressed and made moot." *Id.*

Just last year, this Court rejected a nearly identical argument. In *Return Mail, Inc. v. United States Postal Service*, the patentee asked this Court "to adopt a test for determining whether claims are 'directed to' an abstract idea by looking to whether the claims have preempted others from entering the field." 868 F.3d 1350, 1369-70 (Fed. Cir. 2017). This Court declined to do so, holding that "[p]reemption is . . . part and parcel with the § 101 inquiry." *Id.*

American Axle's preemption arguments also fail on the merits. The crux of its argument is that the asserted claims preempt only the use of Hooke's Law for propshaft liners, not to other applications (such as washing machines). (AAM Br. at 24, 67-69 (citing Dr. Rahn's expert report (Appx1928-1929) where he identifies a washing machine as one of the "myriad applications" of Hooke's law).) But "the prohibition on patenting an ineligible concept cannot be circumvented by limiting the use of an ineligible concept to a particular technological environment." *Versata Dev. Grp., Inc. v. SAP Am., Inc.*, 793 F.3d 1306, 1332 (Fed. Cir. 2015); *see also Alice*, 134 S. Ct. at 2358. American Axle cannot patent a law of nature even in the particular technological environment of propshaft liners.

B. The District Court Did Not Misunderstand The Laws Of Nature

American Axle asserts that the district court improperly equated Hooke's Law with friction damping. (*See, e.g.*, AAM Br. at 37-38 ("The record is simply devoid of any evidence to support the court's conclusion that 'Hooke's law [results in] friction damping.'").)

But American Axle's argument misreads the district court's decision. The full context of the district court's statement is below:

> The Court agrees with Neapco. There is no dispute that adjusting the mass and stiffness of the liner will change the amount of damping of a certain frequency. ***The claimed methods*** are applications of Hooke's law with the result of friction damping. (*See, e.g.*, D.I. 151 at 496 (inventor Sun testifying that "tuning" is "basic physics")).

Appx11. As is evident, the district court was not stating that ***Hooke's Law*** results in friction damping; it was saying that ***the claimed methods*** result in friction damping. And this point is undeniably true: when the liner is inserted into the propshaft, as instructed by the claimed methods, friction damping—a natural law itself—results. Appx34 (claim 1 ("positioning the at least one liner within the shaft member")); Appx1930 (Rahn Rebuttal Rep. ¶ 396 ("[F]riction damping is a property of physics experienced by any two surfaces in contact.")).

The '911 patent itself explains this use of friction damping. For example, when describing four prior art patents, the '911 patent explains that they "appear to disclose hollow multi-ply cardboard liners that are press-fit to the propshaft."

Appx30, 2:26-27. And two of those prior art patents disclose cardboard liners with retaining strips that have "high frictional properties to frictionally engage the propshaft." *Id.* at 2:29-34. Because of this frictional engagement (between either press-fit cardboard liners or helical retaining strips and the inside surface of the propshaft), the '911 patent explains that they "disclose a resistive means for attenuating shell mode vibration." *Id.* at 2:34-36. The district court properly recognized that the asserted claims do no more than take these prior art liners' use of friction damping and instruct that Hooke's Law be applied to dampen bending mode vibrations.

American Axle's out-of-context-reading of this sentence fragment also overlooks the rest of the opinion, which states that Hooke's Law and friction damping are two separate laws of nature. Indeed, the opinion states that "the issue presented is whether the Asserted Claims as a whole are directed to laws of nature: Hooke's law ***and*** friction damping." Appx10. The opinion goes on to accurately describe Hooke's law as the relationship between force F, displacement *x*, and stiffness *k*. Appx10-11. It even observed that friction damping, a separate law of nature, "is a property of physics experienced by any two surfaces in contact." *Id.* at Appx11 (quoting Dr. Rahn at Appx1930). American Axle's assertion lacks merit.

C. American Axle's Discussion Of The Accused Products Is Irrelevant

American Axle argues that Neapco studied its patents and products to learn how to tune liners, and that such studying—which purportedly shows the claims' novelty—supports the eligibility of the claims. (AAM Br. at 16-18.)

First, even if American Axle's copying assertion were true—it is not, and Neapco hotly disputes American Axle's characterizations—it is still legally irrelevant, having nothing to do with the § 101 analysis. It surely has nothing to do with whether the claimed steps of providing a propshaft and using a liner were conventional in the industry—the '911 patent makes abundantly clear they were.

Perhaps more significantly, the documents on which American Axle relies show no recognition of an advance in the industry. Instead, they reflect incredulity by Neapco that American Axle obtained such a broad patent on such a well-known, abstract concept. For example, in an email between Neapco engineers, Rob Wehner and Gary Parker, Mr. Wehner remarks that the American Axle patents "are extremely broad in scope," noting that "the concepts proposed have been in use in some form for decades by Neapco/Visteon/ACH, Dana, and others…." Appx825. He then says, "I don't know how they would ever hold up if challenged." *Id.*

Similarly, in a different internal email, Neapco engineer Niladri Das questioned the validity of such a broad abstract concept, noting: "[I]t is hard to

enforce common design practices i.e. changing mass and stiffness to tune frequenc[y]." Appx828.

In a third internal email, Mr. Wehner explains that Neapco's liners, in use for decades, likely read on the asserted claims because they would have attenuated both shell modes and bending modes:

> We've used composite (cardboard + elastomer) linings since the early 90's, and it's reasonable to assume that at least one of those applications affectively [sic] attenuated both a shell mode and a bending mode (1st, 2nd or 3rd), whether intentionally or by accident or by accident [sic]. One could speculate that radial dampers we have used in applications like the 2002 Saturn Vue were also affective [sic] shell mode dampers, although not specifically developed for that purpose, and thereby would also constitute prior art.

Appx3510. In yet another email, Mr. Wehner made a similar observation, stating that "[t]he concept they [American Axle] have patented is pretty ridiculous, because almost any liner or IVA (including the one we've used for decades) will naturally have several dominant natural frequencies." Appx827.

Remarkably, American Axle even suggests that Neapco studied the '911 patent to learn which liner characteristics relate to mass and stiffness for "controlling" and tuning the liner. (AAM Br. at 17.) But Neapco's engineers long understood that these variables relate to the mass and stiffness of the liner, and thus could be adjusted to "tune" it to match a certain frequency. *E.g.*, Appx1308-1309, Appx1318 (Wehner Tr. 89:21-90:6; 128:4-9).

These documents are far afield from the Supreme Court's § 101 test, and American Axle's reliance on them is misplaced. They have nothing to do with the only questions that matter. They create no genuine dispute of material fact, and they certainly do not stand for the proposition—alleged copying—that American Axle asserts.

CONCLUSION

The judgment of the district court should be affirmed.

Dated: September 21, 2018

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CERTIFICATE OF FILING AND SERVICE

I hereby certify that, on September 21, 2018, I electronically filed the foregoing with the Clerk of Court using the CM/ECF System, which will send notice of such filing to all registered users.

I further certify that, upon acceptance and request from the Court, the required paper copies of the foregoing will be deposited with United Parcel Service for delivery to the Clerk, UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT, 717 Madison Place, N.W., Washington, D.C. 20439.

The necessary filing and service were performed in accordance with the instructions given to me by counsel in this case.

Date: September 21, 2018

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