NO. 18-1763

United States Court of Appeals for the Federal Circuit

AMERICAN AXLE & MANUFACTURING, INC.,

Plaintiff-Appellant,

v.

NEAPCO HOLDINGS LLC AND NEAPCO DRIVELINES LLC,

Defendants-Appellees.

Appeal from the United States District Court for the District of Delaware
in C.A. No. 15-cv-1168, United States District Court Judge Leonard P. Stark

REPLY BRIEF OF PLAINTIFF-APPELLANT

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October 26, 2018

CERTIFICATE OF INTEREST FOR AMERICAN AXLE & MANUFACTURING, INC.

Pursuant to Federal Circuit Rules 26.1 and 47.4, counsel for Plaintiff-Appellant American Axle & Manufacturing, Inc. certifies the following:

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

American Axle & Manufacturing, Inc.

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:

Not Applicable.

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

American Axle & Manufacturing Holdings, Inc.

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: October 26, 2018

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INTRODUCTION

The claims at issue are industrial processes—methods for manufacturing large metal propshafts for vehicles, with novel cardboard and elastomer liners tuned to match and damp multiple different types of propshaft vibration in different ways. The claims are therefore directed to "a new and useful [propshaft manufacturing] technique" and "achieve 'a new and useful end,' [] precisely the type of claim that is eligible for patenting." *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1048 (Fed. Cir. 2016). The mere existence of an unrecited mathematical formula for determining the frequency of objects does not render the claims ineligible. *Id.* at 1050 (Precluding an invention "simply because it touches on something natural would 'eviscerate patent law.'").

At step one, Neapco mischaracterizes the claims as only having three elements: providing a hollow shaft, inserting a liner, and tuning. The claims as written and construed, however, require significant and numerous other limitations, including matching and damping multiple different propshaft bending and shell modes in particular ways (e.g., oscillating for bending mode and deforming for shell mode). Neapco must misconstrue the claims because it concedes that Hooke's law is unrelated to matching, damping, and the particular way a liner damps vibration. When the entirety of each claim is considered it is clear that the claims are directed to a method for manufacturing an improved propshaft with

reduced vibration. *Id*. at 1050 ("This new and improved technique, for producing a tangible and useful result, falls squarely outside those categories of inventions that are 'directed to' patent-ineligible concepts.").

At step two, Neapco does not even dispute numerous inventive concepts identified by American Axle. No one knew that a liner could be tuned, a liner could be used to damp bending mode vibration, or a liner could be tuned to multiple different vibration modes and damp them in multiple different ways. In addition, the claimed liners were not conventional, because liners were never previously used to match and damp bending mode vibrations. Thus, the claims are patent eligible. *Id*. at 1050-52 (Applications of a natural law to "improve existing methods" are eligible.). Finally, at the very least, fact issues that Neapco admits are "hotly disputed" preclude summary judgment.

ARGUMENT

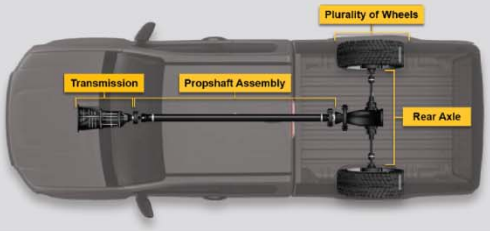
I. The Claims Are Patent-Eligible Under *Mayo*/*Alice* Step One

A. The Claims Are Directed To Methods For Manufacturing Improved Propshafts

The asserted claims as written and construed are methods for manufacturing propshafts. Independent claim 1 is reproduced in the below demonstrative:

Claim 1

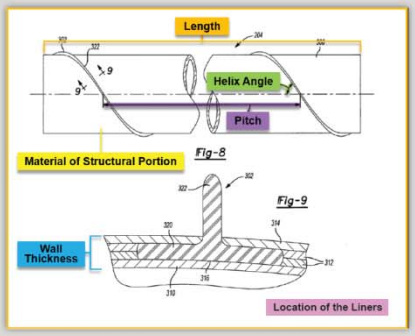
1[a]: A method for manufacturing a shaft assembly of a driveline system, the driveline system further including a first driveline component and a second driveline component, the shaft assembly being adapted to transmit torque between the first driveline component and the second driveline component, the method comprising:



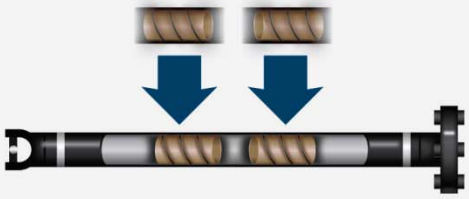
1[b]: providing a hollow shaft member;

1[c]: tuning at least one liner to attenuate at least two types of vibration transmitted through the shaft member; and

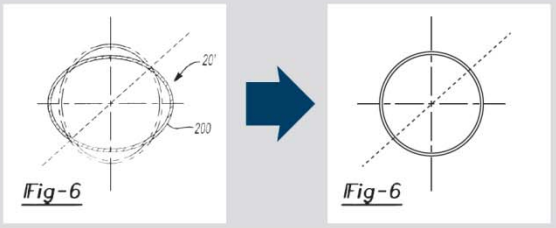
[M]ass, length and outer diameter of the liner **204**, diameter and wall thickness of the structural portion **300**, material of which the structural portion **300** was fabricated, the quantity of the resilient members **302**, the material of which the resilient members **302** was fabricated, the 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**.



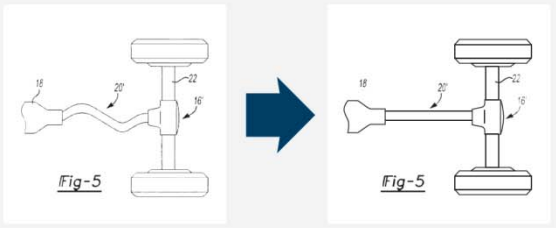
1[d]: positioning the at least one liner within the shaft member



1[e]: 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%,



1[f]: 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 ±20% of a bending mode natural frequency of the shaft assembly as installed in the driveline system.



Claim 22 as written and construed is similar.[1]

The preamble recites "[a] method for manufacturing a shaft assembly of a driveline system" and confirms that the asserted claims are directed to patent-eligible methods for manufacturing improved propshafts. Appx34, 1[a], 22[a]; *see, e.g.*, *Vanda Pharm. Inc. v. W.-Ward Pharm. Int'l Ltd.*, 887 F.3d 1117, 1134 (Fed. Cir. 2018) (citing preamble to hold "the asserted claims are not directed to patent-ineligible subject matter"); *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016) (same); *c.f. Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1340 (Fed. Cir. 2017) ("[W]e see no error here in the district court citing to the preamble in its review.").[2]

The specification likewise confirms eligibility. *See Enfish, LLC v. Microsoft*

[1] There are no representative claims and, in fact, the parties were ordered to submit separate briefing relating to claims 1 and 22. *Compare* Appx4330-4336 (claim 22 and dependents) *and* Appx6194 (claim 1 and dependents); *see also* Appx6194; 7049; 6432-6445. Neapco, nonetheless, ignores claim 1 in favor of claim 22 because it seeks to improperly strip claim 22 of two wherein limitations. NDBr at 24. Neapco cannot prove ineligibility of claim 1 and its dependents—which lack "wherein" clauses—by focusing its arguments only on claim 22. While American Axle stated that "the differences between claim 22 and claim 1 are minor" neither party ever contended that the "wherein" clauses of claim 22 were non-limiting. Neapco's contrary intimating is misleading, at best.

[2] Contrary to Neapco's mischaracterizations, American Axle never asserted "that claims for 'methods of manufacturing' and 'methods of producing' can never run afoul of the natural law exceptions to patent eligibility." *Compare* NDBr at 28 *and* AAMBr at 31-32. However, American Axle is not aware and Neapco has not identified a single decision finding such claims ineligible.

Corp., 822 F.3d 1327, 1337 (Fed. Cir. 2016) ("[S]pecification's teachings that the claimed invention achieves other benefits over" prior technologies supported and bolstered the conclusion that the claims were directed to an improved technology and not ineligible.); *Vanda*, 887 F.3d at 1135 (claims "directed to a specific method of treatment for specific patients using a specific compound at specific doses to achieve a specific outcome" eligible under step 1, in part, because the specification "highlights the significance of the specific dosages"). For example, the specification describes how the asserted patents overcame a need in the art for improved methods for attenuating propshaft vibration:

> In view of the foregoing, **there remains a need in the art for an improved method** for damping various types of vibrations in a hollow shaft. **This method facilitates the damping of shell mode vibration as well as the damping of bending mode vibration.**

Appx30.

The specification also describes an example of how to design a tuned liner, and specifies its diameter, thickness, mass, materials, position within propshaft, and other characteristics that are "controlled." Appx33. The liners are designed to act as both "a tuned resistive absorber for attenuating shell mode vibrations" and "a tuned reactive absorber for attenuating bending mode vibrations." Appx33; Appx1047. Neither the prior art nor Hooke's law informs or relates to the advantages or specific liner design described in the specification. *Infra* I.C.

Eligibility challenges for method claims such as these have been summarily dismissed. *See, e.g., Nike, Inc. v. Puma N. Am., Inc.*, No. 18-10876-LTS, 2018 WL 4922353, at *4 (D. Mass. Oct. 10, 2018), Appx7283 (processes for manufacturing tangible items were "plainly directed to patent-eligible subject matter: shoes"); *see also Zircore, LLC v. Straumann Mfg., Inc.*, No. 2:15-cv-01557, 2017 WL 2901703, at *2 (E.D. Tex. Jan. 20, 2017), Appx7286 (claimed "method of manufacturing" was eligible because it was "directed to a method of manufacturing *physical* crown copings for prosthodontics") (emphasis in original). Neapco also fails to mention, let alone distinguish, several cases requiring a finding of patent eligibility here:

- *CellzDirect*, 827 F.3d at 1048 (claimed "method of producing" was eligible and like "thousands of others that recite processes to achieve a desired outcome, e.g., methods of producing things");

- *Hitkansut LLC v. United States*, 130 Fed. Cl. 353, 380 (2017), *aff'd*, 721 F. App'x 992 (Fed. Cir. 2018), Appx7259 (claimed "method[s] of changing a physical property of a structure" were eligible as they were "directed to a new and more efficient method for treating metal parts to change their physical properties");

- *Vanda*, 887 F.3d at 1134-35 (claimed method of treating a disease was patent eligible because it did not claim a natural relationship itself—the inventors "claimed an application of that relationship.");

- *Enfish*, 822 F.3d at 1337 (claims were patent eligible where they achieve "benefits over" prior technologies and cautioning against eligibility determinations "untethered from the language of the claims"); and

- *Zircore, LLC*, 2017 WL 2901703, at *2, Appx7286.

The asserted claims are therefore eligible and the district court's decision

should be reversed.

B. Neapco Ignores Significant Claim Limitations And Constructions

1. The Claims As a Whole Are Patent Eligible

Neapco's entire eligibility argument is based on the incorrect assertion that the claims only have three elements: providing a hollow shaft; inserting a liner; and the "concept of 'tuning.'" NDBr at 24. The claims are not so broad. Neapco improperly eliminates the preamble, claim elements, and constructions bolded below:

> **1[a] 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:**
>
> 1[b] providing a hollow shaft member;
>
> 1[c] [***controlling characteristics of at least one liner to configure the liner to match a relevant frequency or frequencies to reduce at least two types of vibration transmitted through the shaft member***]; and
>
> 1[d] positioning the at least one liner within the shaft member
>
> **1[e] 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%,**
>
> **1[f] 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 ±20% of a bending mode natural frequency of the shaft assembly as installed in the driveline system.**

Appx34; Appx1046.[3]

The asserted claims therefore recite significantly more than Neapco's mischaracterizations, including "controlling liner characteristics" to both "match" a liner frequency to a relevant propshaft frequency and "damp" at least two types of vibration in a particular manner, e.g., bending mode vibrations by "oscillating in opposition to vibration energy to cancel out a portion of the vibration energy to dampen bending mode vibrations" and shell mode vibrations by "deforming as vibration energy is transmitted through the liner to absorb the vibration energy." Appx34-35; Appx1046-1047. Simply tuning a liner to a particular frequency does not result in the claims. *See infra* II.B. The frequency of the liner must be matched to different natural propshaft vibration modes. *See id*. In addition, the characteristics of the liner must be controlled to ensure the liner damps the relevant vibration modes. *See id*. Performing the "method for manufacturing" claims results in an improved propshaft with reduced vibration.

Neapco also improperly characterizes the "tuning" limitations, 1[c] and 22[c], as "a mere recitation of a natural law—Hooke's law." NDBr at 25. Even assuming *arguendo* that Hooke's law could be used to determine the frequency of a liner, Neapco does not dispute Hooke's law has nothing to do with at least the

[3] Neapco also improperly excludes the following claim preambles, elements and constructions for claim 22: 22[a], 22[c], 22[e], 22[f]. *Supra* I.A.

following claim elements and constructions:

- Hooke's law has nothing to do with certain "characteristics of the liner 204 [that] can be controlled to tune its damping properties," such as "location of the liners 204 within the shaft member 200." Appx33; *compare* AAMBr at 42 *with* NDBr at 24-33.

- Hooke's law has nothing to do with "matching" frequencies between multiple different objects (e.g., between a liner and a propshaft). *Compare* AAMBr at 40-41 *with* NDBr at 24-33.

- Hooke's law has nothing to do with the claimed damping. *Compare* AAMBr at 21-23, 40-41, 48-49 *with* NDBr at 55-57. Neapco does not dispute, for example, that its own testing of the Econoline propshaft shows that liners having a frequency that allegedly "matched" a relevant propshaft bending mode frequency **amplified, not damped,** vibration at that frequency. AAMBr at 41. Hooke's law is also independent of shell mode damping. AAMBr at 22.

- Hooke's law has nothing to do with how a liner specifically attenuates different types of vibration. *Compare* AAMBr at 40-41 *with* NDBr at 24-33. Assuming *arguendo* that Hooke's law could determine the frequency of a liner, Hooke's law is unrelated to whether that liner has characteristics configured to act as a "resistive absorber" to "deform as vibration energy is transmitted through the liner to absorb the vibration energy." Appx1047. Hooke's law is similarly unrelated to whether the liner has characteristics configured to act as a "reactive absorber" to "oscillate in opposition to vibration energy to cancel out a portion of the vibration energy." *Id*.

Neapco also **provides no explanation** for ignoring limitations 1[e] and 1[f]. *Supra* n.1. These claim elements are admittedly and undisputedly limiting (e.g., 2% or greater shell mode damping and specific amount of liner matching). Appx34. Claim 1 is therefore eligible regardless of whether this Court accepts Neapco's request to "remove" limitations 22[e] and 22[f] from claim 22. NDBr at

38.

Moreover, that limitations 22[e] and 22[f] start with "wherein" does not mean they "add nothing to the claimed method" or that Neapco can simply "remove" them to serve its purpose. NDBr at 24, 38.[4] "[W]hen the 'whereby' [or 'wherein'] clause states a condition that is material to patentability, it cannot be ignored in order to change the substance of the invention." *Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329-30 (Fed. Cir. 2005) (giving effect to "whereby" clause that was "integral part of the invention").

Here, both limitations 22[e] ("tuned resistive absorber") and 22[f] ("tuned reactive absorber") provide substantive and material meaning to claim 22 and must be given effect. The district court construed both limitations to require not only that the liners have "characteristics configured to match a relevant frequency or frequencies," but also that the liner be configured to dampen shell and bending mode vibrations in a particular manner. Appx1047. Ignoring limitations 22[e] and 22[f], as Neapco requests, eliminates the claimed requirement of configuring the liners to absorb shell and bending mode propshaft vibrations in a specific manner,

[4] The district court only addressed the "wherein" clauses in step two of its analysis, and incorrectly found that they are merely the result achieved from performing the method. Appx14-15. As set forth herein, the "wherein" clauses were construed by the court to have significant limitations necessary to practice the asserted claims, give meaning to other recited steps of the method, and cannot be ignored.

and improperly "change[s] the substance of the invention." *Hoffer*, 405 F.3d at 1329.

Neapco's attempt to simply "remove" limitations 22[e] and 22[f] is further belied by its assertions giving those limitations effect. NDBr at 38. Neapco, for example, proposed and argued for claim constructions of limitations 22[e] and 22[f]. Appx69-70; Appx241-245; Appx516-524. Neapco also argued that it did not infringe based on those limitations. Appx1414; Appx1423; Appx1433. Neapco never argued that 22[e] and 22[f] are non-limiting, and the Court should reject Neapco's attempt to do so now.

It is therefore Neapco that "wishes to recast" the asserted claims. NDBr at 29. The "exemplary elements" identified by American Axle in its demonstrative pie chart are not "divorced from the actual claim language" (NDBr at 28), rather they track the claims and their constructions. AAMBr at 40. Neapco cannot strip these elements from the asserted claims by simply mischaracterizing them as "unclaimed steps." NDBr at 28. When the claims are properly "read as a whole" they are clearly patent eligible. *Data Engine Techs. LLC v. Google LLC*, 2018 WL 4868029, at *7-*8 (Fed. Cir. Oct. 9, 2018), Appx7275-7277.

2. Select Inventor Testimony Does Not Support Ineligibility

This Court should reject Neapco's attempt to elevate select snippets of inventor deposition testimony over the claims themselves. NDBr at 25-26. This

Court has routinely acknowledged the limited probative value of litigation-derived inventor testimony. *See, e.g., Solomon v. Kimberly-Clark,* 216 F.3d 1372, 1379-80 (Fed. Cir. 2000) (section 112 ¶ 2); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995).

Here, the deposition testimony of American Axle's inventor is of little probative value as to whether the asserted claims are "directed to" Hooke's law under Step 1, and certainly cannot outweigh the claim language and constructions. This is particularly true given that Neapco mischaracterizes the cited testimony and omits other testimony. AAMBr at 44-45. Dr. Sun's cited testimony, for example, concerned the use of FEA analysis (which Neapco admits is "certainly not claimed," NDBr at 42) to simplify otherwise complex liners to model and predict their performance. Appx1767-1773; Appx3202 (comparing physical and FEA results). Moreover, Neapco does not address how Dr. Sun further testified that Hooke's law does not apply to tuned liners. Appx1751 ("[I]t's more complicated than that."); Appx1752 ("You will never be able to simplify that way.").

3. The Caselaw Relied On By Neapco Is Inapposite

Neapco incorrectly relies on *Mayo,* which addressed claims that only described "laws of nature—namely, relationships between the concentrations of certain metabolites in the blood and the likelihood that a dosage of a thiopurine drug will prove ineffective or cause harm." *Mayo Collaborative Servs. v.*

Prometheus Labs., Inc., 566 U.S. 66, 77 (2012); NDBr at 27. Unlike *Mayo*, the asserted claims here do not only describe a law of nature or some "relationship between an object's physical properties." NDBr at 27. Neapco concedes that Hooke's law has nothing to do with several significant claim limitations as explained above. *Supra* I.B.1. Thus, even if Hooke's law may be used to identify a frequency of an object, the asserted claims are directed to much more.

Nor do the asserted claims suffer the same "breadth and abstractness" of those at issue in *Wyeth v. Stone* ("a method for cutting ice") and *O'Reilly v. Morse* ("a method for printing intelligible characters, letters, or signs at any distances"). NDBr at 31. Neapco alleges that the claims are so broad by discarding and referring to material and substantive limitations as mere "window-dressing." NDBr at 28; *supra* I.B.1. These limitations are not window-dressing—they are important steps in the method for manufacturing an improved propshaft with reduced vibration.[5]

Because Neapco concedes that Hooke's law fails to explain matching, damping, and attenuation as required by the asserted claims—when properly viewed—the district court's conclusion that the claims are "directed to" an

[5] American Axle is not relying on "unrecited limitations" as Neapco contends, but rather the express claim language and constructions discussed above. *Automated Tracking* is readily distinguishable for this reason. NDBr at 29-30.

"application[] of Hooke's law with the result of friction damping" was erroneous and should be reversed. Appx11.

C. Neapco's New "Abstract Idea" Theory Is Untimely, Waived, And Untenable

Neapco advances a new "Abstract Idea" theory for the first time on appeal. *See* NDBr at 1, 21, 24, 30. Neapco never advanced an "abstract idea" theory, but rather only argued that the claims are directed to two laws of nature, Hooke's law and friction damping.[6] The Court should therefore disregard Neapco's new arguments. *See Polara Eng'g Inc v. Campbell Co.*, 894 F.3d 1339, 1355 (Fed. Cir. 2018) ("[A]s a general rule a federal appellate court does not consider an issue not passed upon below.") (quotation omitted).[7]

Regardless of the lateness of the new theory, the claims are not directed to an abstract idea. They are directed to an improvement in the physical propshaft

[6] *See, e.g.*, Appx1602, 1605 (opening expert report); Appx2704-2705 (reply expert report); Appx6206, 6208 (supplemental expert report); Appx1248-1249 (summary judgment opening brief); Appx4596-4597 (summary judgment opposition brief); Appx6587 (first supplemental opposition brief); Appx7119 (second supplemental opposition brief); Appx7220-7224 (summary judgment hearing); Appx10 (summary judgment opinion).

[7] This Court's decision in *BRCA-1* does not entitle Neapco to raise a new theory on appeal. NDBr at 32. Unlike Neapco, the defendant argued to the district court that the claims at issue "are directed to products of nature or **abstract ideas**." *In re BRCA1-, BRCA2-Based Hereditary Cancer Test Patent Litig.*, 3 F. Supp. 3d 1213, 1256 (D. Utah 2014) (emphasis added). The district court agreed and found the comparisons described in the two method claims were directed to an ineligible abstract idea. *See id*. at 1267.

structure itself—for example, propshafts with tuned liners for addressing bending mode vibrations. Prior to the invention, slip yoke dampers, internal dampers, and plugs—not liners—were used to damp bending mode vibrations. Appx30; Appx3504-3505; Appx3417-3422; Appx1967-1968. Prior art liners were used to provide general broadband damping of shell mode vibrations, but liners were not used to damp bending mode vibrations prior to the claimed inventions. AAMBr at 59. Thus, the claims are directed to an improvement in the propshaft structure itself. They require a new specific physical arrangement (e.g., liners tuned to match and damp bending mode vibration) and result in an improved propshaft. The claims are therefore not directed to an abstract idea and are patent eligible. *See Enfish*, 822 F.3d at 1336 (claims "directed to a specific improvement in the way [the allegedly conventional structures] operate" held patent eligible and not directed to an abstract idea.); *Data Engine*, 2018 WL 4868029, at *7-*8, Appx7275-7277 (claimed method that "differ[ed] from prior art" methods and provided "specific structures" for improvement was patent eligible.).

The cases relied upon by Neapco do not support a finding of ineligibility in this case. In *Automated Tracking Sols., LLC v. Coca-Cola Co.*, this Court faulted the claims at issue (which involved non-analogous systems for locating and tracking objects using RFID components) for not requiring a "particular configuration or arrangement of RFID system components." 723 F. App'x 989,

994 (Fed. Cir. 2018).[8] In *Interval Licensing LLC v. AOL, Inc.*, this Court again faulted the claims at issue (which involved non-analogous systems for displaying content) for failing to specify a particular "means" for achieving the claimed display arrangement.[9] 896 F.3d 1335, 1346 (Fed. Cir. 2018). Lastly, in *BRCA1- & BRCA2-Based Hereditary Cancer Test Patent Litig.*, this Court similarly faulted the claims at issue (which involved non-analogous methods for identifying alterations in genes through comparisons of BRCA sequences previously found patent-ineligible) for failing to specify the number of, type of, or purpose of the comparisons. 774 F.3d 755, 763 (Fed. Cir. 2014).

American Axle's claims, by contrast, involve a vastly different technology (propshaft manufacturing) and specify an inventive, physical arrangement—e.g., tuned cardboard and elastomer liners that have specific characteristics so that they match and damp multiple different vibration modes (including bending modes) in multiple different ways—as explained above and in II.B *infra*. The asserted

[8] The court in *Automated Tracking* specifically recognized that methods that used components in a "non-conventional manner" were not abstract and were patent eligible. *Id.* citing *Thales Visionix Inc. v. United States*, 850 F.3d 1343 (Fed. Cir. 2017).

[9] The claims here are eligible and different than the claims in *Interval Licensing* for at least the same reasons set forth in *Data Engine*, 2018 WL 4868029, at *7-*8, Appx7575-7277 ("unlike ineligible claims that merely 'collect[], organiz[e], and display… information on a generic display device," the claims here recite "a specific improvement to the way [liners]… operate.").

claims, for example, do not recite or relate to the abstract idea of "locating and tracking," "displaying," or "comparing," as in *Automated Tracking*, *Interval Licensing*, and *BRCA-1*.

Nor are there an "unlimited" number of claimed tuned liners, and the asserted claims do not cover "liners that have yet to be discovered" as Neapco contends.[10] NDBr at 33 (citing *BRCA-1*). While the claimed liners can be "customized" they are eligible because they are "specific structure[s]" that "implement [] specific function[s]." *See Data Engine*, 2018 WL 4868029 at *8, n.3, Appx7276 (claims eligible even though specific structures could be "customized" where they "implement a specific function—an improved manner of navigating through the spreadsheet"). For example, the claims achieve bending and shell mode vibration reduction via liners alone (as opposed to other prior art mechanisms)—this is a specific function and "improved manner" of reducing propshaft vibration. *See id*. The claims specifically require liners that (1) oscillate in opposition to cancel out a portion of the vibration of the propshaft and (2) deform to absorb a portion of the vibration of the propshaft. Appx1047. Neapco's

[10] Neapco also incorrectly asserts that a single discrete liner design with exact dimensions must be claimed in order to be patent eligible. NDBr at 30 (arguing the claims are ineligible because there is more than one way to tune a liner). *Automated Tracking*, however, is not so limited and is completely different than the claims here which claim a specific liner that is configured to match and damp propshaft vibrations.

straw-man arguments are premised on its improper oversimplification of the asserted claims as merely methods for identifying a frequency of an object. NDBr at 33. The claims are limited to liners that implement specific functions and are eligible on that basis. *See id*.

D. The District Court Erroneously Concluded That Hooke's Law Results In Friction Damping

The district court erroneously concluded that "[t]he claimed methods are applications of Hooke's law with the result of friction damping." Appx11. Neapco concedes that Hooke's law does not result in friction damping and that Neapco never advanced such a position. *Compare* AAMBr at 22, 40-41 *with* NDBr at 55-57. Neapco nevertheless attempts to support the district court's erroneous statement, now arguing "that ***the claimed methods*** [not Hooke's law] result in friction damping." NDBr at 55 (emphasis in original). This argument is equally flawed and nonsensical because neither Hooke's law nor friction damping explain, at a minimum, reactive attenuation of bending mode vibration as required by the claims, e.g., by oscillating in opposition to the propshaft vibration. *Supra* I.B.; AAMBr at 18-23. Regardless of how the district court's conclusion is framed, it is erroneous and should be reversed.

II. The Claims Are Patent-Eligible Under *Mayo*/*Alice* Step Two

A. The Claims Include Several, Undisputed Inventive Concepts

The claims include inventive concepts that were significant advances—

repeatedly acknowledged by Neapco and its engineers as such—in propshaft noise and vibration reduction technology. *See* AAMBr at 57-58 (listing numerous inventive concepts). The following exemplary inventive concepts are undisputed:[11]

- It was inventive to tune a liner because it was previously unknown—and in fact Neapco and others did not think it was possible—to tune liners;
- It was inventive to use a liner to damp bending mode vibrations; and
- It was inventive to use a damper to damp multiple different types of vibration with the same device.

The inventiveness of these concepts was explicitly and repeatedly recognized by Neapco and its engineers and was explained in detail in American Axle's Opening Brief. *See* AAMBr at 16-18. Neapco undertook extensive efforts to copy American Axle's patents and products and made admissions regarding the advantages and inventiveness over the prior art. *Id.*; Appx3510-3511 (attenuating both bending and shell modes was "what [Neapco was] trying to achieve" with its liners); Appx3513 (tuned liners "solved the issue").

Neapco relies on internal emails referring to American Axle's patents as "broad" and suggesting that they would not "hold up if challenged" in an attempt to discredit the overwhelming evidence of inventiveness above as irrelevant.

[11] Neapco does not even address inventive concepts other than "tun[ing] liners to attenuate bending mode vibrations" and, accordingly, has conceded the additional inventive concepts presented by American Axle. NDBr at 36.

Appx825-828; Appx3510. But Neapco's self-serving statements do nothing to contradict how, when faced with a problem in designing its propshafts, Neapco copied American Axle's patents and products.[12] AAMBr at 16-18. Neapco did not turn to the prior art[13] or conventional methods—it turned to American Axle's patents and products. Neapco admitted the solution of the '911 patent was previously unknown and recognized it as an improved "extremely low cost solution." Appx1915-1916; Appx3513; Appx3281 (GM, same). This evidence conclusively establishes inventive concepts at step two.

Neapco also fails to mention, let alone distinguish, several cases directly on point:

- *CellzDirect*, 827 F.3d at 1047-48, 1050 (Inventive concepts existed where the claims "recite an improved process" and "the benefits of the improved process over the prior art methods are significant.").

- *Exergen Corp. v. Kaz USA, Inc.*, 2018 WL 1193529, at *3-4, Appx7249-7250 (Fed. Cir. Mar. 8, 2018) (Claims were eligible where the elements were "not conventional, routine, and well-understood" and "simply being known in the art" does not defeat eligibility.).

- *Hitkansut*, 130 Fed. Cl. at 382 (Inventive concepts existed even where the

[12] Neapco mischaracterizes this evidence as copying only and irrelevant. NDBr at 57. Neapco, however, argued § 103 is relevant to eligibility. NDBr at 52. Copying is relevant to the obviousness inquiry and therefore relevant for the step two eligibility inquiry.

[13] Neapco references Visteon and other prior art liners as evidence that liners were used in propshafts before. NDBr at 6-7, 57. None of those prior art liners, however, were tuned or damped bending mode vibrations.

> claims "rely on [a mathematical formula] in an inventive manner to process materials more efficiently.").

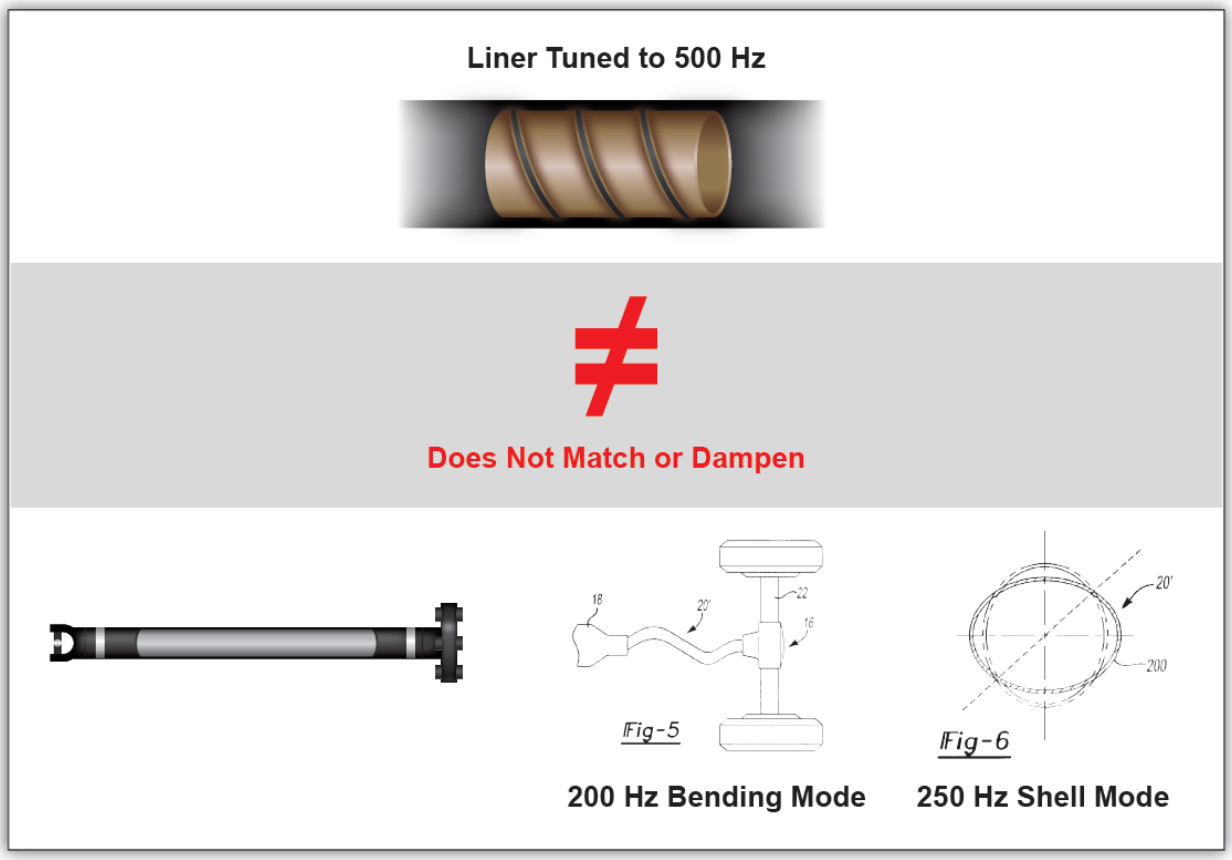
The claims are therefore eligible and the district court's decision should be reversed.

B. The Claims Do Much More Than Recite A Natural Law And Instruct Engineers To Apply It

Neapco again grossly mischaracterizes the claims and ignores elements altogether to argue that the claims recite conventional elements and only "apply" a natural relationship. NDBr at 34-35, 38 (removing "wherein" language to characterize the claims).

The claims require steps that are not themselves requirements of applying Hooke's law: for example, (1) the use of liners for reducing bending mode vibrations, (2) the placement of liners within the propshaft, and (3) controlling the specific characteristics of liners so that they match and damp. As explained in American Axle's Opening Brief and summarized in the demonstrative below, even assuming an engineer applied Hooke's law to tune a liner to a particular frequency, that application does not mean that the liner and propshaft will achieve the claimed results—the claims require more than mere application of the alleged law.[14]

[14] Neapco argues that *Mayo* dictates a finding of ineligibility. *See* NDBr at 36-37 ("claiming a process consisting of telling linear accelerator operators to refer to [Einstein's $E=mc^2$] to determine the relationship between energy and mass").



AAMBr at 49.

Even liners that have a frequency that is tuned to, or "matches," a relevant propshaft frequency do not necessarily achieve the claimed results. Neapco's own testing of the Econoline propshaft and liners demonstrates that liners that "match" a second bending mode frequency of the propshaft decrease the amount of damping by 16%—which means the liners actually **amplify** vibration at that frequency. Appx2828; *see also* Appx5217-5218; Appx1887-1891; Appx3417;

American Axle's claims, however, do not merely tell engineers to refer to Hooke's law to determine the relationship between mass, stiffness, and frequency.

Appx2822-2823; AAMBr at 21-22. Thus, merely "applying" Hooke's law does not result in the claimed invention.

Because American Axle's claims do not require that engineers undertake process steps that they would have to undertake simply to use Hooke's law, they are unlike the claims at issue in *Mayo*. 566 U.S. at 82 (claimed steps "must be taken in order to apply the laws in question"). An application of Hooke's law to propshaft manufacturing could involve "myriad" applications that are not claimed by American Axle. Appx1928-1929 (American Axle's expert opining as to applications of Hooke's law and friction damping not covered by the asserted claims); Appx1603-1604 (Neapco's expert agreeing); Appx4660-4661; Appx1928. The claims at issue are not a process telling engineers to apply Hooke's law "somehow"—they require a particular arrangement that goes well beyond the alleged natural law to achieve particular results and are thus patent eligible. *See Mayo*, 566 U.S. at 82.

Like *Diamond v. Diehr*, which Neapco fails to distinguish, the claims at issue recite specific, detailed steps (i.e., controlling characteristics of liners) to achieve an end-result (i.e., propshafts having reduced bending mode and shell mode vibrations). 450 U.S. 175, 192 (1981); *see also CellzDirect*, 827 F.3d at 1048 ("[E]nd result" of "method of producing" was "new and improved" despite employing a law of nature to create such a result.).

C. Even If The Claims Apply Hooke's Law At Some Level, They Do So In An Inventive, Non-Generic Manner

Neapco makes a failed attempt to reframe "tun[ing] liners to attenuate bending mode vibrations" as "generic 'application[s] of [a] natural law in a particularized field." NDBr at 36. To the extent that the claims allegedly apply Hooke's law, the manner in which they do is far from generic.

Here, the claims require controlling the characteristics of a liner to match multiple propshaft frequencies, damp multiple, different types of propshaft vibration at those frequencies (e.g., bending and shell mode vibrations), and do so in multiple, different ways (e.g., reactive and resistive attenuation). Appx34-35; Appx1046-1047. There is nothing generic or conventional about the claimed methods.

Prior to American Axle's invention, other mechanisms (not liners) were used to damp bending mode vibrations. Appx30; Appx3504-3505; Appx3417-3422; Appx1967-1968. Even assuming *arguendo* that the claims apply Hooke's law at some level, they do not apply Hooke's law using conventional methods at least because the claimed methods do not employ one of the prior art mechanisms for bending mode vibration—they use liners.

Neapco argues that the claims "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." NDBr at 37. This argument fails, even by its own words, because if the liner is tuned to attenuate bending mode vibrations—the liner is then no longer the alleged "prior art liner." Also, merely determining the frequency of a liner does not mean that the liner will match or damp the relevant bending mode. The characteristics of the liner must be controlled (e.g., thickness, location, etc.) to both match and damp propshaft vibration modes. *Supra* I.B.1. The claims require a propshaft having improved vibration performance, which is achieved in a new, more efficient way (i.e., tuned liners).

Thus, the claims at issue, to the extent that they apply Hooke's law, are inventive at least because they apply the alleged law to address bending mode vibrations in propshafts using a new, improved, and more efficient process (i.e., tuned liners, one vibration mechanism instead of two, etc.) not the methods set forth in the prior art (i.e., slip yoke dampers, internal dampers, and/or plugs). *See, e.g.*, *Hitkansut*, 130 Fed. Cl. at 382 (claims were patent eligible where they relied on a mathematical relationship "in an inventive manner to process materials more efficiently"); *CellzDirect*, 827 F.3d at 1050-51; *Exergen*, 2018 WL 1193529, at *3-4, Appx7249-7250.

D. The Claims Do Much More Than Limit An Alleged Natural Law To A Particular Technological Environment And Do Not Merely Claim A Desirable Result

Neapco alleges that "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." NDBr at 39-40 (alleging this is a natural law limited to a "particular technological environment"). Neapco's "technological environment" argument misses the mark.[15] The claims in *Electric Power Grp., LLC v. Alstom S.A.* did "not go beyond requiring the collection, analysis, and display of available information in a particular field," i.e., "the power-grid field." 830 F.3d 1350, 1351 (Fed. Cir. 2016). American Axle does not merely claim "tuning liners" or tuning dampers in the "automotive field." American Axle claims much more. *Supra* I.A., I.B.1.

Neapco's reliance on *Electric Power* and *Parker v. Flook* regarding a means to achieve the claims is also misplaced. The claims in *Electric Power* merely collected, analyzed and displayed information "without limiting them to technical means." *Elec. Power*, 830 F.3d at 1351. Similarly, the claims in *Flook* did not specify "the means of setting off an alarm or adjusting an alarm system." 437 U.S. 584, 586 (1978).

In contrast to those cases, the claims here specify a "means"—liners. The

[15] Neapco also improperly defines the relevant technological field as the claimed solution itself. Neapco's myopic approach perverts all of patent law, as "some measure of preemption is intrinsic in the statutory right granted with every patent." *CLS Bank Int'l v. Alice Corp. Pty.*, 717 F.3d 1269, 1281 (Fed. Cir. 2013).

asserted claims recite specific tuned liner designs for reducing vibration. Several dependent claims, for example, recite particular liner materials (e.g., cardboard or paperboard) and structures (helically-wrapped resilient member). Appx34-35 (claims 12, 13, 19, 26, 27, 31). The district court therefore committed error when it concluded that the asserted claims "are not directed to any specific discrete liner design" and "provide no particular means of how to craft the liner." Appx16-17. Moreover, the claimed liners not only match multiple, relevant propshaft vibration mode frequencies, but damp multiple, different types of vibration in a particular manner. *Supra* I.B.1. Neapco also fails to appreciate that Hooke's law can be applied to other unclaimed "means" and without matching and damping multiple propshaft vibrations modes in a particular manner.

In *Diehr*, the Supreme Court (in distinguishing over the token post-solution activity in *Flook*) held that the specification of a structure (such as liners) indicates patent eligibility:

> [W]hen a claim containing a mathematical formula **implements or applies that formula in a structure** or process which, when considered as a whole, is performing a function which **the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing**), then the claim satisfies the requirements of § 101.

450 U.S. at 192; *see also CellzDirect*, 827 F.3d at 1047-48. American Axle's patent and claims explain how to make a liner by controlling the liner

characteristics (material, length, location, etc.) so that the liner matches and damps the relevant propshaft vibrations.

Neapco also incorrectly asserts that the claims attempt to patent a result rather than any means. NDBr at 46 (citing *Electric Power*). American Axle's claims do not simply patent some unspecified improved bending and shell mode performance (let alone through an application of Hooke's law). Nor do they allow for "every potential solution" to the problem of propshaft vibration as Neapco suggests. NDBr at 47. Other vibration attenuation mechanisms, e.g., untuned liners, slip yoke dampers, internal dampers, and/or plugs, were known in the art and are not covered by the claims. *Supra* II.C.

Instead, American Axle's claims are eligible because they specify particular results (i.e., frequency matching and damping in specific numerical values) and, crucially, a "particular means of achieving them" (i.e. using liners to address bending mode vibrations and tuning liners by controlling their characteristics). *Electric Power*, 830 F.3d at 1356. Further, Neapco incorrectly faults American Axle for allegedly not specifying a discrete liner design. NDBr at 47-49 (arguing exact dimensions must be claimed in order to be patent eligible). Neapco's argument fails because no such requirement exists in patent law and the '911 patent specifically teaches how to control the characteristics of a liner to match and damp relevant propshaft vibrations as applied to a specific propshaft. AAMBr at

64-66.

E. Neapco Admits That Disputed Issues of Fact Exist

At a minimum, fact issues preclude summary judgment at step two. *See* AAMBr at 66-67. To the extent Neapco has not conceded numerous inventive concepts, Neapco admits that facts relating to inventive concepts are "hotly disputed":

- "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**." NDBr at 36.
- "[E]ven if American Axle's copying assertion were true—it is not, and **Neapco hotly disputes American Axle's characterizations**." NDBr at 57.

NDBr attempts to support the district court's dismissal of this issue in a footnote (*see* Appx14) by citing to alleged evidence that is not in the district court's order. NDBr at 45. Neapco also incorrectly attempts to attack American Axle's expert, Dr. Rahn, but there is no dispute that Dr. Rahn is one of skill in the art and submitted substantial evidence and testimony regarding these factual issues. At a minimum, disputed issues of fact exist and this case should be remanded for further proceeding. *See, e.g.*, *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

III. Neapco Mischaracterizes American Axle's Preemption Arguments

American Axle never argued "there is a separate 'preemption' analysis" or

to "adopt a new test." NDBr at 53-54. The Court should reject Neapco's strawman attacks.

American Axle simply repeated that which is well accepted—preemption is "the concern that drives the exclusionary principle" of § 101. AAMBr at 68 (collecting cases). Evidence that Neapco's alleged natural laws apply to unclaimed devices for attenuating propshaft vibration (Appx1928, Appx1603-1604, Appx4660-4661), necessarily informs the *Mayo*/*Alice* two-step analysis. *Compare McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1315-16 (Fed. Cir. 2016) (reviewing under step one) *with Bascom*, 827 F.3d at 1350 (reviewing under step two).

The district court, however, did not consider American Axle's evidence and arguments **at all**, let alone "part and parcel with the § 101 inquiry." *Return Mail, Inc. v. United States Postal Serv.*, 868 F.3d 1350, 1369-70 (Fed. Cir. 2017); *see* AAMBr at 67-69. That was in error.

CONCLUSION

The district court erred in granting summary judgment of invalidity under Section 101. This Court should reverse judgment and remand this case for further proceedings.

October 26, 2018

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CERTIFICATE OF SERVICE

I hereby certify that, on the 26th day of October, 2018, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which thereby served a copy upon all counsel of record.

Upon acceptance by the Court of the e-filed document, the required six paper copies of the brief will be delivered to the Court via Federal Express, priority overnight, within the time provided in the Court's rules.

Dated: October 26, 2018

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CERTIFICATE OF COMPLIANCE

I hereby certify that this brief complies with the type-volume limitations of Fed. Cir. R. 32(a). This brief contains 6,996 words (including diagrams and images), excluding the parts of the brief exempted by Fed. R. App. P. 32(f) and Fed. Cir. R. 32(b), as counted by Microsoft® Word 2010, the word processing software used to prepare this brief.

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