

Keywords: patentable subject matter, natural law

General: Claims directed to a natural law without recitations of how to apply the natural law are unpatentable under Section 101.

American Axle & Manufacturing, Inc. v. Neapco Holdings LLC, Neapco Drivelines LLC.

United States Court of Appeals for the Federal Circuit

No. 2018-1763

Decided October 3, 2019

I. Background and Facts

U.S. Patent No. 7,774,911 (“the ‘911 patent”) generally relates to a method for manufacturing driveline propeller shafts (“propshafts”) with liners that are designed to attenuate vibrations transmitted through a shaft assembly. Propshafts are used in vehicles to transmit rotary power in a driveline. Because propshafts are typically made of a relatively thin-walled steel or aluminum tubing, they are receptive to various driveline excitation sources. The excitation sources can cause the propshaft to vibrate in three modes: bending mode, torsion mode, and shell mode.

American Axle & Manufacturing, Inc. (“AAM”) sued Neapco Holdings LLC and Neapco Drivelines LLC (collectively, “Neapco”) alleging infringement of claims of the ‘911 patent. The parties filed cross-motions for summary judgement as to the eligibility of the asserted claims of the ‘911 patent under 35 U.S.C. § 101. The district court granted Neapco’s motion and held that the asserted claims are ineligible under § 101. Claim 1 of the ‘911 patent, representative of the asserted claims, reads:

A method for manufacturing a shaft assembly of a driveline system ... adapted to transmit torque ..., the method comprising:

providing a hollow shaft member;

tuning at least one liner to attenuate at least two types of vibration transmitted through the shaft member; and

positioning the at least one liner within the shaft member such that the at least one liner is configured to damp shell mode vibrations in the shaft member by an amount that is greater than or equal to about 2%, and the at least one liner is also configured to damp bending mode vibrations in the shaft member, the at least one liner being tuned to within about $\pm 20\%$ of a bending mode natural frequency of the shaft assembly as installed in the driveline system.

The innovation disclosed in the ‘911 patent is that the shaft-liner is attuned to attenuate two types of vibration modes (i.e., shell mode and bending mode). Prior art liners were widely used in damping shell mode vibration but not in dampening bending mode vibrations. The district court concluded that the asserted claims as a whole are directed to laws of nature, namely Hooke’s law and friction damping. The district court held that the claims’ direction to tune a liner to attenuate to different vibration modes amounted to merely instructing one to apply Hooke’s law to obtain a desired result of dampening certain vibration modes without

providing the means of how to craft and/or attenuate such a liner to get the desired result. AAM appealed.

II. Issues

1. Did the district court err in concluding that the claims are ineligible for patentability because they are directed to a natural law and do not provide a particular means for how craft the liner to obtain the desired result of attenuating both the bending mode vibrations and the shell mode vibrations?

III. Discussion

No. The court of appeals found the asserted claims patent ineligible under the *Mayo/Alice* test because the asserted claims of the '911 patent recite an application of natural laws and omit any physical structure or steps for achieving the claimed result of damping both the bending and shell mode vibrations. The court concluded that the focus of the claimed advance is simply the concept of achieving the results of using a liner to dampen both the bending and shell mode vibrations by whatever structures or steps happen to work.

AAM, although agreeing that attuning the liners to dampen the vibrations of the propshaft involves an application of Hooke's Law, argued that the claims are not merely directed to an application of Hooke's Law, since attenuating two different vibration modes is a process that involves significantly more than an application of Hooke's Law, as Hooke's Law is simply a first order approximation of forces within a spring having a constant stiffness value relatively to any displacement. AAM argued that a liner contains complex stiffnesses that are distributed within the body of the liner having stiffnesses in different directions depending on locations of applied forces and on measured displacements such that an analysis beyond Hooke's Law is needed to achieve the desired result.

At step 1 of the *Mayo* test, the court held that the claims are directed to laws of nature and do not instruct how variables (e.g., mass, length, materials, angles, etc.) of the liner are controlled and/or changed to obtain the frequencies needed to achieve a dual-damping result, in any unconventional way. The court found that the variables of the liner specified in the application are well-known to be able to be controlled and tested through experimental modal analysis. The court further found that no specifics of any novel computer modelling nor experimental modal analysis to achieve the result were disclosed in the application or claims, and that the unclaimed features (e.g., support in specification for certain modelling and analyses during a design process) cannot function to remove the asserted claims away from the state of being ineligible subject matter. The court further cited the Supreme Court's analysis in *Parker v. Flook* as reinforcing its conclusion that a claim to a natural law concept without specifying the means of how the natural law is incorporated is ineligible under section 101. In *Flook*, the Supreme Court held that even "if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory."¹ At step 2 of the *Mayo* test, the court held that the claims do not contain an inventive concept, since the methods of performing experimental modal analysis was conventional. As such, the court ruled that engaging in a conventional

¹ 437 U.S. at 595 (quoting *In re Richman*, 563 F.2d 1026, 1030 (C.C.P.A. 1977)).

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process (e.g., trial and error experimentation) to obtain the desired result of the double dampening of bending and shell mode vibrations “does not make a patent eligible invention, even if the desired result to which that process is directed would be new and unconventional.” As the patent claims do not describe a specific method for applying Hooke’s law, but simply state that the liner should be tuned to dampen certain vibrations, the claims’ instruction to tune a liner essentially amounts to the sort of directive prohibited by the Supreme Court in *Mayo*—i.e. “simply stat[ing] a law of nature while adding the words ‘apply it.’” 566 U.S. at 72.

IV. Conclusion

The court of appeals ruled that the district court did not err in finding the asserted claims to be patent ineligible using the *Mayo* test. Specifically, the court ruled that (1) at step 1, the claims are directed to laws of nature without determining how variables (e.g., mass, length, materials, angles, etc.) are used in achieving the desired result and (2) at step 2, the claims asserted claims lack an inventive concept. The court held that the assert claims encompass an application of the law of nature and merely reinstate a achieving a result rather than a means to achieve the result.

V. Dissent

In dissent, Judge Moore emphasized that the court of appeals expanded section 101 beyond its function. He asserts that the claims contain the necessary physicality (e.g., physical liner positioned in a driveshaft to reduce shell and bending mode vibrations) to achieve the desired result and further contain many inventive concepts (as found in the independent claims), such as using a cardboard liner to reduce bending mode vibrations and controlling characteristics of a cardboard liner to attenuate multiple types of vibrational modes.

Further, Judge Moore believes that the majority’s concern was not that the claims are directed to Hooke’s Law and other natural laws, but rather that the claims do not recite how to tune the liner to dampen both bending and shell mode vibrations. As such, Judge Moore notes that the majority’s problem with the claims is not one of eligibility, but rather, enablement. The dissent concludes with a discourse on how section 101 should not be used to invalidate claims through enablement, since the law code under section 112 should be used to determine enablement matters.