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Paper 14
Entered: July 20, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZHONGSHAN BROAD OCEAN MOTOR CO., LTD.,
BROAD OCEAN MOTOR LLC, and
BROAD OCEAN TECHNOLOGIES, LLC,
Petitioners,

v.

NIDEC MOTOR CORPORATION,
Patent Owner.

Case IPR2015-00763
Patent 7,208,895 B2

Before BENJAMIN D. M. WOOD, JAMES A. TARTAL, and
PATRICK M. BOUCHER, *Administrative Patent Judges*.

BOUCHER, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

On February 20, 2015, Zhongshan Broad Ocean Motor Co., Ltd., Broad Ocean Motor LLC, and Broad Ocean Technologies, LLC ("Petitioners") filed a Petition (Paper 3) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claim 9 of U.S. Patent No. 7,208,895 B2 ("the '895 patent"). Concurrent with their Petition, Petitioners filed a motion to join this proceeding with IPR2014-01122 ("the related proceeding"), which was instituted on January 21, 2015. Paper 4. Nidec Motor Corporation ("Patent Owner") filed a Preliminary Response (Paper 12, "Prelim. Resp.") to the Petition on April 21, 2015. Pursuant to our authorization, Petitioners filed a Reply (Paper 13) on April 28, 2015, limited to addressing the joinder issues.

Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioners would prevail with respect to at least one challenged claim, we deny the Petition and do not institute an *inter partes* review. Accordingly, we dismiss as moot Petitioners' motion to join.

I. BACKGROUND

A. The '895 patent (Ex. 1001)

The '895 patent relates to torque control of permanent magnet rotating machines. Ex. 1001, col. 1, ll. 15–17. Figure 1 of the '895 patent is reproduced below.

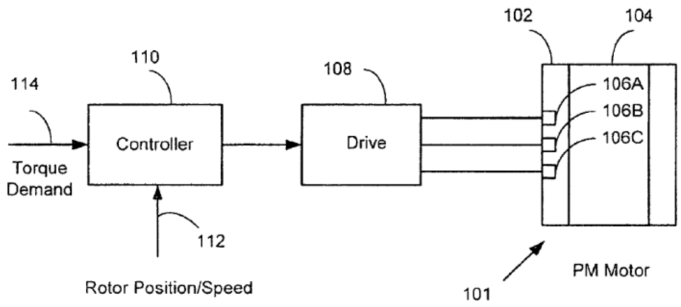


FIG. 1

Figure 1 is a block diagram of a rotating permanent magnet machine system. *Id.* at col. 2, ll. 4–6. Rotating permanent magnet electric machine 101 includes rotor 104 and stator 102, around which energizable phase windings 106A, 106B, and 106C are wound. *Id.* at col. 2, ll. 14–22. Drive 102 receives control inputs from controller 110, which receives rotor position and speed data 112 from sensors coupled to the machine. *Id.* at col. 2, ll. 24–30.

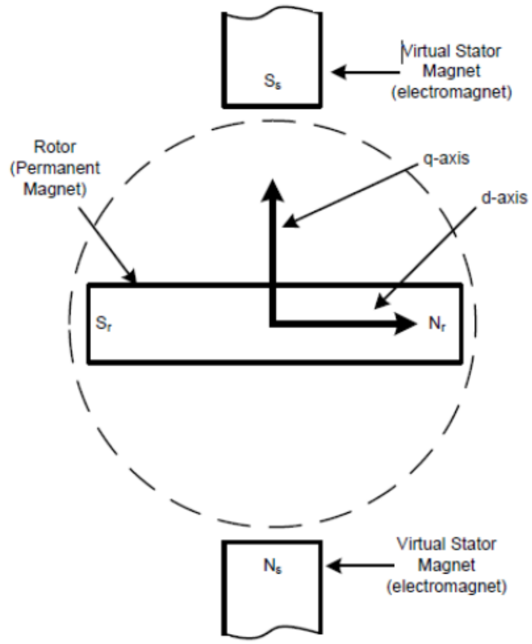
When operated in a torque control mode, input torque demand 114 is provided to a torque scalar that produces a scaled torque demand. *Id.* at col. 2, ll. 63–67. The '895 patent illustrates calculation of the scaled torque demand as the sum of three components: (1) the torque offset, which is the minimum torque required to run the motor without a load; (2) the product of the torque demand and a torque multiplier; and (3) a speed offset, which may be determined from a look-up table containing speed-torque table values for the particular motor being controlled. *Id.* at col. 4, ll. 15–35. "The torque multiplier and the torque offset value are preferably motor-specific parameters which compensate for individual motor characteristics."

Id. at col. 4, ll. 20–22. A constant motor torque output with increasing motor speed may be achieved by increasing the value of the demanded torque by the control system as the motor operating speed increases, thereby making the torque lines flatter with speed. *Id.* at col. 4, ll. 39–43.

The scaled torque demand is used to calculate an "IQr demand" using motor-specific torque-to-IQr map data. *Id.* at col. 2, l. 67 – col. 3, l. 3. The IQr demand is concatenated with an "Idr demand" (also referred to as a "dr-axis injection current") from an Idr injection block into a vector quantity, "IQdr demand." *Id.* at col. 3, ll. 3–6. The resulting IQdr demand takes into account the torque contribution, if any, of the dr-axis current. *Id.* at col. 3, ll. 10–12.

Petitioners' witness, Dr. Mark Ehsani, explains that "vector control" provides one method of controlling permanent-magnet synchronous motors, and that "[t]he concept of vector control, which typically uses d and [Q] current components, arises from [a] principle [in which] torque arrives from the interaction of two magnetic fields, one originating from the stator and one originating from the rotor." Ex. 1007 ¶ 13.

The drawing from page 7 of Dr. Ehsani's Declaration is reproduced below.



The drawing from Dr. Ehsani's Declaration illustrates a rotor, which has a permanent magnet having north and south poles N_r and S_r, respectively, and illustrates a stator, which includes electromagnets that result in a virtual stator magnet having north and south poles N_s and S_s, respectively. *Id.* at ¶ 15. The d axis is aligned with the rotor and the q axis is offset 90° from the d axis. The motor commutates the winding currents to maintain orthogonality of the d and q axes as the rotor turns. *Id.* at ¶ 16.

B. Challenged Claim

The challenged claim, and the independent claim from which the challenged claim depends, are as follows.

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