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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PEDRO RODRIGUEZ, CAJETAN PINTO,
MACIEJ ORMAN, MICHAL ORKISZ,
ULF AHREND, ROLF DISSELNKÖTTER,
PAWEL RZESZUCINSKI, and JAMES OTTEWIL[1]

Appeal 2018-001123
Application 14/440,271
Technology Center 2800

Before CARLA M. KRIVAK, DEBRA K. STEPHENS, and
AARON W. MOORE, *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1–18. We have jurisdiction under 35 U.S.C. § 6(b). An Oral Hearing was conducted on March 20, 2018.

We reverse.

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[1] Appellants identify the real party in interest as ABB Research Ltd. (*see* App. Br. 2).

STATEMENT OF THE CASE

Appellants' invention is directed to a method "for identifying a fault in an electrical machine" (Spec. ¶ 1).

Independent claim 1, reproduced below, is exemplary of the subject matter on appeal.

> 1. A method for identifying a fault condition in an electrical machine in which at least a stator or a rotor has electrically parallel winding branches, the method comprising the steps of:
>
> - taking a first measurement, via at least one current sensor implemented in the electrical machine, for obtaining a first set of circulating current values between two electrically parallel winding branches, wherein each winding branch comprises a single coil;
>
> - applying, via a processor, a frequency analysis on the first set of circulating current values to obtain at least one frequency component;
>
> - identifying, via the processor, on the basis of the at least one frequency component, a type of fault condition of the electrical machine;
>
> wherein the method comprises at least one of the following steps performed via the processor:
>
> - determining, on the basis that the at least one frequency component has a value $(2k + 1) f_s \pm f_r$, wherein $k = (2,3, \ldots)$, f_s = supply frequency and f_s = rotational frequency of the electrical machine, that the machine suffers from dynamic eccentricity;
>
> - determining, on the basis that the at least one frequency component has a value kf_s, wherein $k = (2,3, \ldots)$ and f_s = supply frequency, that the machine suffers from static eccentricity; and
>
> - determining, on the basis that the at least one frequency component has a value $(2k + 1) f_s$, wherein $k = (1,2,3, \ldots)$ and f_s = supply frequency, that the machine suffers from inter-turn short circuit in the stator; [and]
>
> - performing maintenance on the electrical machine when the type of fault condition is identified.

REJECTION

The Examiner rejected claims 1–18 under 35 U.S.C. § 101 as directed to non-statutory subject matter.

ANALYSIS

The Examiner states the claims are ineligible under 35 U.S.C. § 101 because they are directed to the abstract concept "of identifying a fault condition in an electrical machine" (Final Act. 2; Ans. 6). The Examiner further finds the method steps merely collect data, manipulate the collected data using mathematical formulas, and generate advisory information based on the characteristics of the data (Final Act. 3; Ans. 2–3). Thus, the claims "tie up or preempt a judicial exception" (*id.*). We do not agree.

We agree with Appellants that "[t]he claims as a whole go beyond merely collecting data, recognizing specific data within the data collected and storing the recognized data in memory" (App. Br. 9). That is, the claims are directed to identifying, using frequency analysis on circulating current values between parallel connected winding branches, a fault condition in an electrical machine (*id.*).

We also agree with Appellants that "applying a frequency analysis to obtain at least one frequency component and identifying a type of fault condition based on the frequency component by determining whether the frequency component" has a particular value based on a certain algorithm "cannot be characterized as data storage and recognition" (App. Br. 10). That is, frequency analysis of circulating current values, as claimed, requires processing data to extract relevant diagnostic information for identifying/detecting a fault in the machine, thereby avoiding serious

damage from occurring (App. Br. 11). Although the algorithms recited in the claims for determining a fault condition based on at least one frequency component could each be performed by a human using pen and paper, a human would not be able to perform these calculations on a set of circulating current values between two electrically parallel winding branches, wherein each winding branch comprises a single coil, with enough time for identifying a fault condition for maintenance before damage occurs. The claims require "at least one frequency component [be] obtained by applying a frequency analysis on a first set of circulating current values, which are measured by at least one *current sensor* implemented in the electrical machine" (emphasis added) (App. Br. 14). Thus, at least one sensor is necessary to obtain and measure the circulating current values. Additionally, a processor is then necessary "to reliably and promptly obtain the frequency component" to determine a fault in the electrical machine at an early stage to avoid damage to the machine (App. Br. 11).

Lastly, we agree with Appellants the claimed method does not preempt all (or even partially) methods for determining faults as the claims require "specific bases for determining the type of fault condition" (dynamic eccentricity, static eccentricity, inter-turn short circuit on the stator) (App. Br. 14). We also agree the Examiner incorrectly finds there is insignificant post-solution activity and/or physical steps to transform the abstract idea into a patent eligible application (Reply Br. 8; Ans. 5).

Thus, we conclude the claims are not directed to an abstract idea and the claim elements considered individually, and as an ordered combination, amount to significantly more than an abstract idea. We, therefore, do not sustain the Examiner's rejection of claims 1–18 under 35 U.S.C. § 101.

DECISION

The Examiner's decision rejecting claims 1–18 under 35 U.S.C. § 101 is reversed.

REVERSED