



US006326750B1

(12) **United States Patent**
Marcinkiewicz

(10) **Patent No.:** **US 6,326,750 B1**
(45) **Date of Patent:** **Dec. 4, 2001**

(54) **ACTIVE REDUCTION OF TORQUE
IRREGULARITIES IN ROTATING
MACHINES**

(75) Inventor: **Joseph G. Marcinkiewicz**, St. Charles,
MO (US)

(73) Assignee: **Emerson Electric Co.**, St. Louis, MO
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/459,543**

(22) Filed: **Dec. 14, 1999**

Related U.S. Application Data

(60) Provisional application No. 60/139,703, filed on Jun. 17,
1999.

(51) **Int. Cl.⁷** **H02P 7/00**

(52) **U.S. Cl.** **318/432; 318/437; 318/434;**
318/802

(58) **Field of Search** 318/432, 437,
318/609, 610, 434, 254, 809, 807, 802,
803, 822, 439, 138, 700, 720-724; 323/220-354

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Primary Examiner—Robert E. Nappi

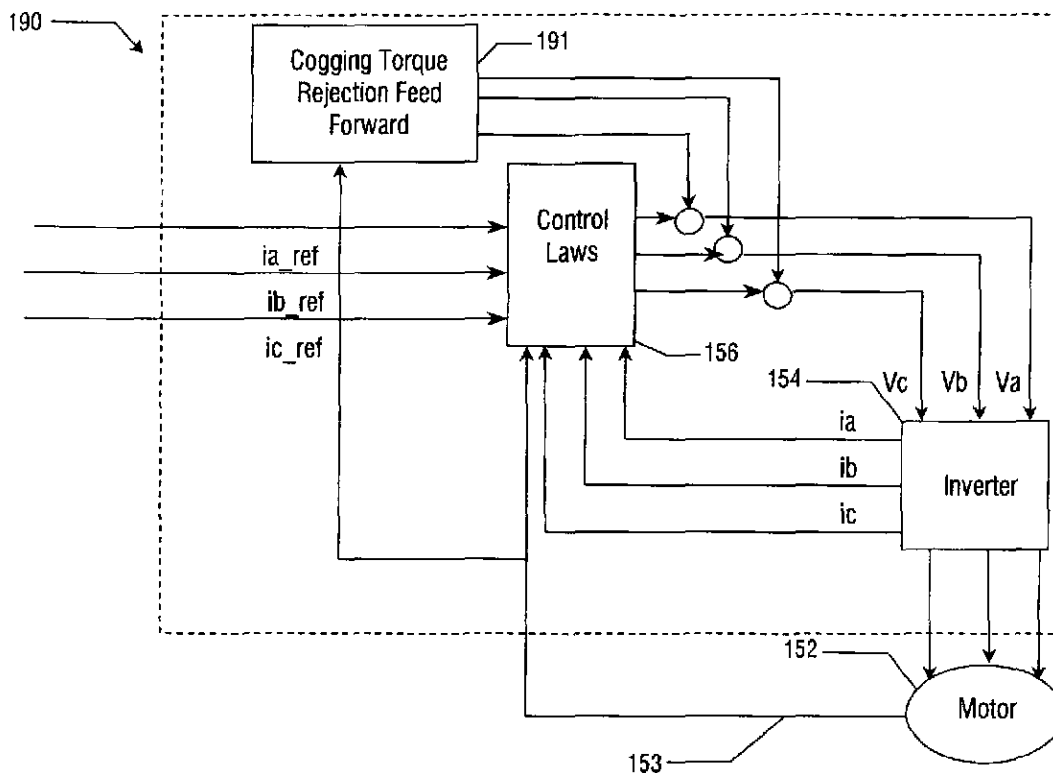
Assistant Examiner—Edgardo San Martin

(74) *Attorney, Agent, or Firm*—Howrey Simon Arnold &
White, LLP

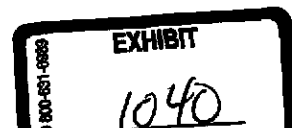
(57) **ABSTRACT**

A method and apparatus for actively controlling the energization of the stator windings of a rotating electromagnetic machine to actively overcome any tendency of the rotor of the machine to prefer certain angular positions with respect to the stator over other angular positions.

24 Claims, 28 Drawing Sheets



BOM Exhibit 1040
BOM v. Nidec



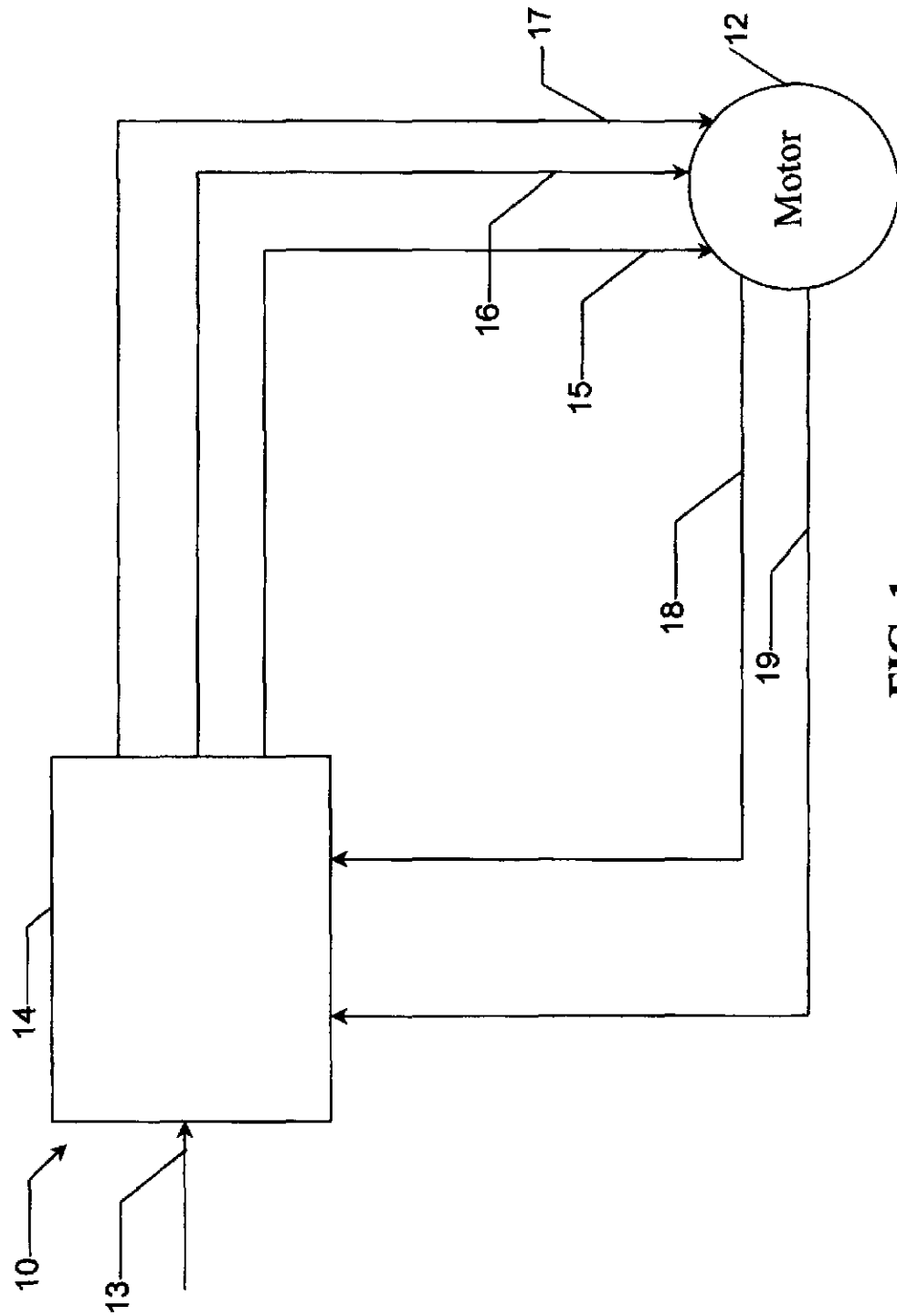


FIG. 1

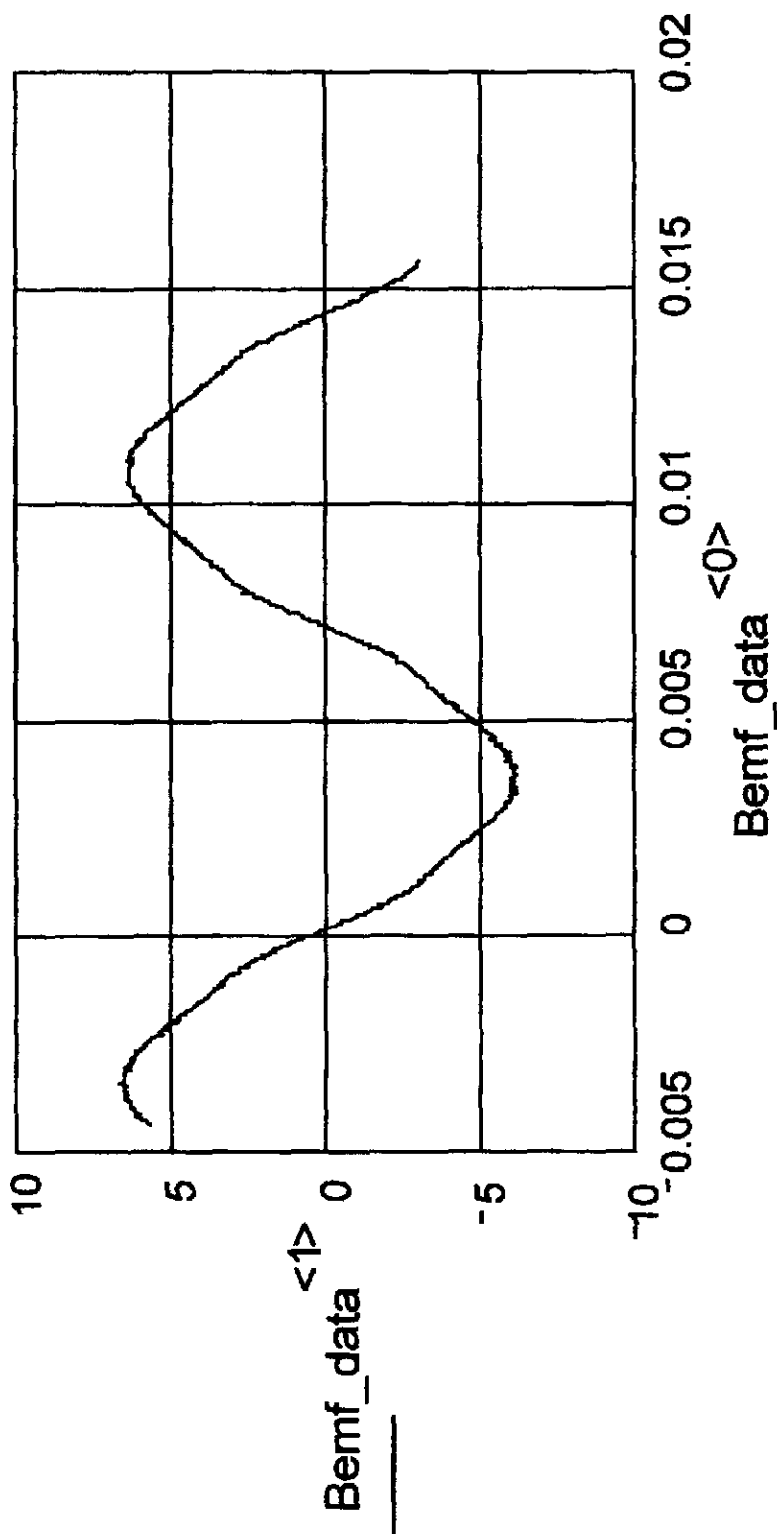


FIG. 2

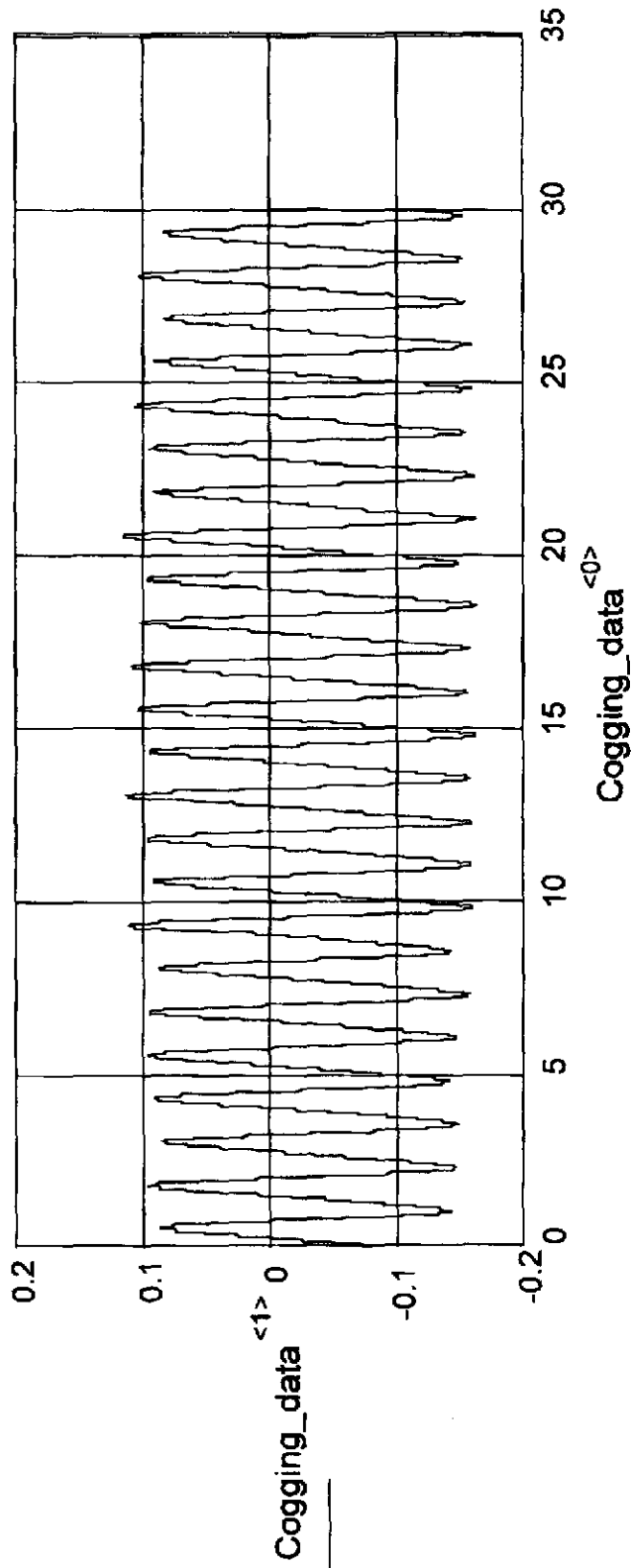


FIG. 3

$$\frac{\text{Bemf_function}(vx, \text{Bemf_fit_parameters})_0}{100}$$

—

100

$$\frac{\text{Bemf_data}^{<1>}}{100}$$

$$\text{Bemf_function}(vx, \text{Bemf_fit_parameters})_0 \pm \text{Bemf_data}^{<1>}$$

—

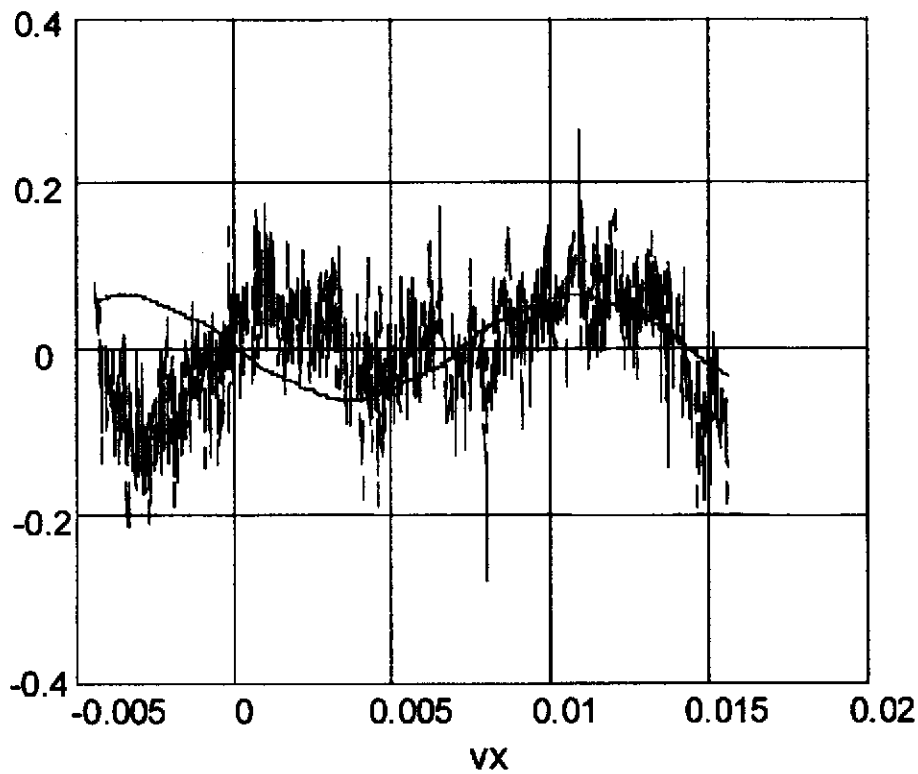


FIG. 4

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