

FORM 2

THE PATENTS ACT, 1970
(39 of 1970)
AND
THE PATENTS RULES, 2003

**COMPLETE
SPECIFICATION**

(See Section 10; rule 13)

TITLE OF THE INVENTION

“AN ACTUATOR HAVING A MULTIPHASE MOTOR, AND A METHOD OF
CONTROLLING SUCH AN ACTUATOR”

APPLICANT

SAGEM DEFENSE SECURITE

of 18-20 Quai du Point du Jour, F-92100, Boulogne-Billancourt, France; Nationality:
France

The following specification particularly describes
the invention and the manner in which
it is to be performed

CLAIMS

1. An actuator comprising at least one multiphase motor (100) having phases (101) facing a rotor (102) secured to an outlet shaft (1) associated with a braking member (2) and provided with means for connecting it to a movable element that is to be moved, the motors and the braking member being connected to at least one motor control unit (5) for controlling the motors by powering their phases, the actuator being characterized in that the motor has at least four phases wound in such a manner as to avoid a neutral point, and in that the control unit has one single-phase inverter per phase and is arranged to implement a nominal mode of control over all of the phases, and a degraded mode of control that enables the rotor to be driven in rotation by powering two non-collinear phases thereof.
2. An actuator according to claim 1, wherein the motor (100) has six phases (101) subdivided into two groups of three phases.
3. An actuator according to claim 1, wherein the rotor (102) has permanent magnets (103).
4. An actuator according to claim 1, wherein the rotor (102) is arranged to present reluctance that varies circumferentially.
5. An actuator according to claim 1, wherein at least some of the phases (101) are wound with wires having differing electric conduction properties.
6. An actuator according to claim 1, wherein at least two position sensors are arranged on either side of the motor and the control unit is arranged to isolate a faulty sensor.

7. An actuator according to claim 1, wherein the control unit (5) has a plurality of control units (7) connected to the set of phases.

5 8. An actuator according to claim 7, wherein the phases (101) are six in number and the control unit (5) has three control modules (7.1, 7.2, 7.3) and three power modules (8.1, 8.2, 8.3), each connected to two phases and to each of the control modules.

10

9. An actuator according to claim 7, wherein the phases (101) are six in number and the control unit (5) has two control modules (7.1, 7.2, 7.3) and three power modules (8.1, 8.2, 8.3) each connected to three phases and to
15 each control module.

Dated this 16 day of June 2014

Arindam Paul
REG.NO:IN/PA-174
of Depenning & Depenning
Agent for the Applicants