

Title (en)

Electromagnetic actuator with two return springs

Title (de)

Elektromagnetischer Antrieb mit zwei Rückstellfedern

Title (fr)

Actionneur électromagnétique muni de deux ressorts de rappel

Publication

EP 1085532 A1 20010321 (FR)

Application

EP 00410104 A 20000830

Priority

FR 9911696 A 19990915

Abstract (en)

The actuator's magnetic circuit comprises a hollow case (20), closed at one end by a fixed core (22) and at the other by a sleeve (24), extending part way into the case. A mobile core (14), carrying the actuating plunger (36), slides with minimal air-gap within the sleeve. The fixed core is bored for the plunger, which extends (38) further to the operated mechanism. Two springs, separated by a washer (42), are passed over the plunger between the two cores. A short stiff spring (44) is seated against a shoulder (39) in the mobile core, while a longer, weaker spring (40) fits into a central chamber (25) in the fixed core, beyond a wider chamber (26) able to receive the washer (42). Two windings on an insulating former (34) are inserted in the annular space between case and cores. An AC voltage is applied by an operating switch or contactor, directly to the maintaining winding (32) and after rectification to the DC actuating winding (30). The resulting plunger movement is opposed, effectively, only by the weaker spring (40), till the washer (42) is halted by meeting the end of the fixed core's outer chamber (26). An auxiliary contact opens the rectifier circuit, but kinetic energy, and increased effort due to reduced air-gap, continue the operating stroke against the stiffer spring till the cores meet. On resetting, the spring adequately overcomes remanence effects.

Abstract (fr)

Un actionneur électromagnétique (10) comporte un circuit magnétique fixe (12, 20, 22) en matériau ferromagnétique et un équipement mobile (14, 16, 18) apte à coulisser axialement entre une position de repos et une position active. Deux ressorts de rappel (40, 44) sollicitent l'équipage mobile (16) vers sa position de repos, le deuxième ressort (44) étant de raideur plus élevée que le premier. Un circuit d'excitation (48) engendre un flux magnétique qui est apte, en mode d'appel à entraîner l'équipage mobile (14) de sa position de repos à sa position active et, en mode de maintien, est suffisante pour le maintien de l'équipage mobile (14) en position active. Dans une première partie de la course axiale de l'équipage mobile (14) de sa position de repos à sa position active, l'action du premier ressort (40) est prépondérante, alors que dans la course restante jusqu'à la position active, l'action du deuxième ressort (44) est prépondérante. <IMAGE>

IPC 1-7

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IPC 8 full level

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CPC (source: EP US)

H01F 7/1607 (2013.01 - EP US); **H01F 7/123** (2013.01 - EP US); **H01F 7/124** (2013.01 - EP US); **H01H 71/2454** (2013.01 - EP US); **H01H 71/2463** (2013.01 - EP US)

Citation (search report)

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