

(19)



(11)

**EP 2 535 916 A3**

(12)

## EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
**13.03.2013 Bulletin 2013/11**

(51) Int Cl.:  
**H01H 71/12 (2006.01)** **H01H 71/24 (2006.01)**  
**H01H 83/20 (2006.01)**

(43) Date of publication A2:  
**19.12.2012 Bulletin 2012/51**

(21) Application number: **12172356.3**

(22) Date of filing: **18.06.2012**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**

- **Weichert, Hans**  
**5722 Gränichen (CH)**
- **Benz, Pascal**  
**5000 Aarau (CH)**
- **Liberto, Sandro**  
**5032 Aarau Rohr (CH)**
- **Villinger, Beat**  
**5001 Aarau (CH)**

(30) Priority: **17.06.2011 US 201113162852**

(71) Applicant: **Rockwell Automation Technologies, Inc.**  
**Mayfield Heights, OH 44124 (US)**

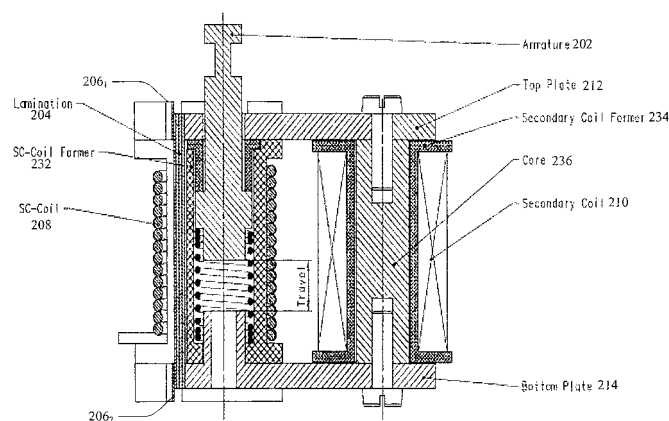
(74) Representative: **Grünecker, Kinkeldey, Stockmair & Schwanhäusser**  
**Leopoldstrasse 4**  
**80802 München (DE)**

(72) Inventors:  
• **Annis, Jeffrey**  
**Waukesha, WI Wisconsin 53189 (US)**

### (54) Improved magnetic core coupling in a current transformer with integrated magnetic actuator

(57) A system comprising a magnetic actuator, a current transformer and operational electronics in a dual-coil circuit breaker. The system includes an inline, but non concentric, implementation of the primary and secondary coils to maintain a narrow width suitable for retrofitting in standard industrial rack mounted enclosures.

The system further comprises an I-shaped lamination stack that is designed to abut on the ends of an upper and lower plate of the current transformer. The I-shaped lamination stack significantly increases the overlap between the lamination and the upper and lower plates, which results in lower magnetic reluctance and improves magnetic coupling.





## EUROPEAN SEARCH REPORT

Application Number  
EP 12 17 2356

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 841 670 A1 (SCHNEIDER ELECTRIC SA [FR]) 13 May 1998 (1998-05-13)	1-4,6,7	INV. H01H71/12 H01H71/24 H01H83/20
Y	* column 7, line 14 - line 62; figures 10-12 *	5,8-15	
	-----		
X	US 2 712 043 A (EMILE MAUPAS CHARLES FRANCOIS) 28 June 1955 (1955-06-28)	1-4	
Y	* the whole document *	5,8-15	
	-----		
X	US 4 134 089 A (CHISMAR MICHAEL T) 9 January 1979 (1979-01-09)	1-4	
Y	* figure 1 *	5,8-15	
	-----		
Y	US 2010/332046 A1 (LIBERTO SANDRO [CH] ET AL) 30 December 2010 (2010-12-30)	5,8-15	
	* the whole document *		
	-----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			H01H
<div> <div>2</div> <div>EPO FORM 1503 03.82 (P04C01)</div> </div>			
Place of search		Date of completion of the search	Examiner
Munich		1 February 2013	Ramírez Fueyo, M
<div> <div>CATEGORY OF CITED DOCUMENTS</div> <div> <div>X : particularly relevant if taken alone</div> <div>Y : particularly relevant if combined with another document of the same category</div> <div>A : technological background</div> <div>O : non-written disclosure</div> <div>P : intermediate document</div> </div> <div> <div>T : theory or principle underlying the invention</div> <div>E : earlier patent document, but published on, or after the filing date</div> <div>D : document cited in the application</div> <div>L : document cited for other reasons</div> <div>&amp; : member of the same patent family, corresponding document</div> </div> </div>			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 17 2356

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0841670 A1	13-05-1998	DE 69705692 D1	23-08-2001
		DE 69705692 T2	08-05-2002
		EP 0841670 A1	13-05-1998
		FR 2755532 A1	07-05-1998
		US 6034858 A	07-03-2000
-----			
US 2712043 A	28-06-1955	NONE	
-----			
US 4134089 A	09-01-1979	CA 1096426 A1	24-02-1981
		US 4134089 A	09-01-1979
-----			
US 2010332046 A1	30-12-2010	CN 101908448 A	08-12-2010
		EP 2249368 A1	10-11-2010
		US 2010332046 A1	30-12-2010
-----			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82