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(54) Title: CAPACITIVE SENSORS ALLOWING CONTACT DETECTION OF NON-CONDUCTING OBJECTS

(57) Abstract: An example apparatus for sensing of both electrically conducting objects (such as persons) and electrically non-conducting objects (18) comprises a sensing element (16), the apparatus being operable to sense a conducting object proximate to the sensing element using capacitive coupling between the sensing element and the conducting object. The apparatus is further operable to sense physical contact with an object, whether electrical conducting or not using a movement of the sensing element (16) relative to a reference conductor, the relative movement being induced by physical contact between the object and the sensing element or an element mechanically coupled with the sensing element. The sensing element may be supported by a deformable structure (14) so that the movement of the sensing element is facilitated by deformation of the deformable structure. Example apparatus may be used with automatic doors (10), gates, and other closures.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC: **G08B 13/08(2006.01);H04Q 9/00(2006.01);G06K 7/00(2006.01)**

USPC: 340/545.1,545.2,547,5.71;235/439,440

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 340/545.1,545.2,547,5.71; 235/439,440

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
US-PGPUB, USPAT, EPO, JPO, DERWENT, IMB_TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,782,759 B2 (SHANK et al) 31 August 2004 (31.08.2004), Figures 1-4 and 12-13, columns 6-8 and columns 10-11.	1-7
X, P	US 7,132,642 B2 (SHANK et al.) 07 November 2006 (07.11.2006), Figures 1-4 and 38-51, columns 7-9 and columns 23-26.	1-7
X,P	US 7,167,093 B2 (FERGUSON) 23 January 2007, Figures 1-11 and columns 3-7.	1-7
X, P	US 7,187,282 B2 (FERGUSON) 06 March 2007 (06.03.2007), see the whole document.	1-7

Further documents are listed in the continuation of Box C.

See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in-conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

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