



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
18.07.2012 Bulletin 2012/29

(51) Int Cl.:
F24C 15/20 (2006.01)

(43) Date of publication A2:
22.02.2012 Bulletin 2012/08

(21) Application number: **11177257.0**

(22) Date of filing: **11.08.2011**

(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

(30) Priority: **17.08.2010 CN 201010259003**

(71) Applicant: **BSH Bosch und Siemens Hausgeräte GmbH**
81739 München (DE)

(72) Inventors:
• **Han, Yu**
210000 Nanjing (CN)
• **Li, Jun**
210046 Nanjing City, Jiangsu Province (CN)
• **Qing, Liyong**
210000 Nanjing Jiangsu (CN)
• **Yuan, Shuai**
210000 Nanjing Jiangsu (CN)

(54) **Control system for a range hood having an automatic fume detection device and control method**

(57) A control system for a range hood (1) having an automatic fume detection device is provided, wherein the system includes a main control module (2) for controlling operation of the range hood (1), a key display module (4), and an ultrasonic module (3) for controlling the automatic fume detection device. The ultrasonic module (3)

is independent of the main control module (2) in structure. The ultrasonic module (3) is connected to the main control module (2) through a power line and a data line. The ultrasonic module (3) is independent of the key display module (4) in structure. The ultrasonic module (3) is connected to the key display module (4) through a data line.

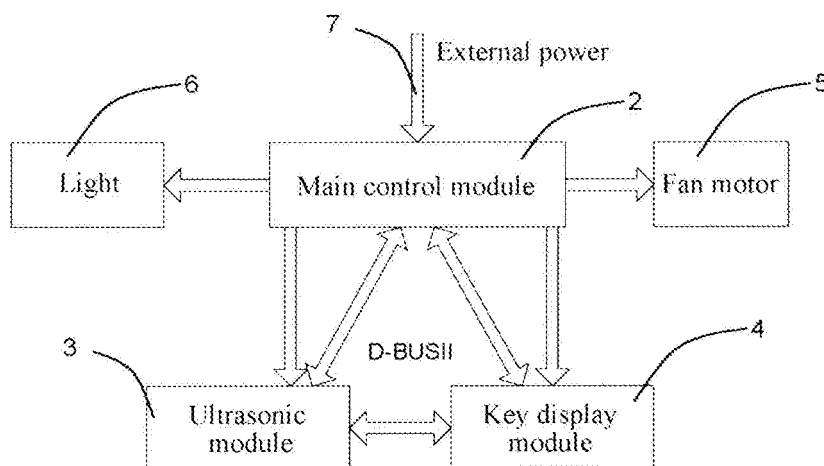


FIG. 2



EUROPEAN SEARCH REPORT

 Application Number
EP 11 17 7257

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 1 333 231 A2 (DIEHL AKO STIFTUNG GMBH & CO [DE]) 6 August 2003 (2003-08-06)	1-3	INV. F24C15/20
Y	* paragraph [0013]; figure 1 *	4	
Y	DE 200 17 525 U1 (TAIWAN SAKURA CORP [TW]) 11 January 2001 (2001-01-11) * page 3, paragraphs 2,3; figures 3,4 *	4	
A,D	EP 1 001 226 A2 (DIEHL CONTROLS NUERNBERG GMBH [DE] DIEHL AKO STIFTUNG GMBH & CO [DE]) 17 May 2000 (2000-05-17) * the whole document *	1-6	
A	DE 10 2004 039549 A1 (MIELE & CIE [DE]) 3 November 2005 (2005-11-03) * the whole document *	1-6	
A,D	EP 0 443 141 A2 (DIEHL GMBH & CO [DE]) 28 August 1991 (1991-08-28) * the whole document *	1-6	
A	DE 41 05 807 A1 (DIEHL GMBH & CO [DE]) 27 August 1992 (1992-08-27) * the whole document *	1-6	TECHNICAL FIELDS SEARCHED (IPC)
A	GB 2 450 732 A (FOOD INDUSTRY TECHNICAL LTD [GB]) 7 January 2009 (2009-01-07) * the whole document *	1-6	F24C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		14 November 2011	Rodriguez, Alexander
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03.82 (P04C01)



Application Number

EP 11 17 7257

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-6

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

EP 11 17 7257

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-6

A control system for range hood (1) having an automatic fume detection device, the control system comprising: a main control module (2) for controlling an operation of the range hood (1), a key display module (4), and an ultrasonic module (3) for controlling the automatic fume detection device, wherein the ultrasonic module (3) is structurally independent from the main control module (2), and the ultrasonic module (3) is connected to the main control module (2) through a power line and a data line; and wherein the ultrasonic module (3) is structurally independent from the key display module (4), and the ultrasonic module (3) is connected to the key display module (4) through a data line.

2. claims: 7, 8

A control method for operating the control system according to any one of claims 4 - 6, wherein a control process for the ultrasonic module (3) comprises: a) enabling the oscillator (31), and maintaining both the first switch (35) and the second switch (39) in an OFF state; b) generating an excitation signal with the oscillator (31), amplifying the excitation signal by the first amplifier (32), and maintaining both the first switch (35) and the second switch (39) in the OFF state; c) waiting for an ultrasonic feedback signal, and maintaining both the first switch (35) and the second switch (39) in the OFF state; d) turning on the first switch (35), receiving a feedback signal, amplifying the feedback signal by the second amplifier (36), and maintaining the second switch (39) in the OFF state; and e) turning on the second switch (39) to start analog-to-digital sampling for obtaining AD sampling data, and maintaining the first switch (35) and the second switch (39) in an ON state.

3. claims: 9, 10

A control method for operating the control system according to claim 5 or 6, wherein a control process of the ultrasonic module (3) comprises: a) presetting ultrasonic signal threshold values VMAX and VMIN in the Micro Control Unit; b) performing signal sampling for obtaining a mean sampled value VMeanValue; and c) comparing the mean sampled value VMeanValue with the ultrasonic signal threshold values VMAX and VMIN, and adjusting the amplification factor of the second amplifier (36) according to a comparison result.

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

EP 11 17 7257

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.

14-11-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1333231 A2	06-08-2003	DE 10203679 A1	07-08-2003
		EP 1333231 A2	06-08-2003
		PL 358504 A1	11-08-2003
DE 20017525 U1	11-01-2001	DE 20017525 U1	11-01-2001
		US 6446624 B1	10-09-2002
EP 1001226 A2	17-05-2000	DE 19851884 A1	18-05-2000
		EP 1001226 A2	17-05-2000
		US 6324889 B1	04-12-2001
DE 102004039549 A1	03-11-2005	NONE	
EP 0443141 A2	28-08-1991	DE 4005363 A1	22-08-1991
		EP 0443141 A2	28-08-1991
		US 5074281 A	24-12-1991
DE 4105807 A1	27-08-1992	DE 4105807 A1	27-08-1992
		FR 2673269 A1	28-08-1992
		IT 1254802 B	11-10-1995
		IT MI920147 U1	24-08-1992
GB 2450732 A	07-01-2009	EP 2188574 A2	26-05-2010
		GB 2450732 A	07-01-2009
		GB 2450967 A	14-01-2009
		WO 2009004332 A2	08-01-2009