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AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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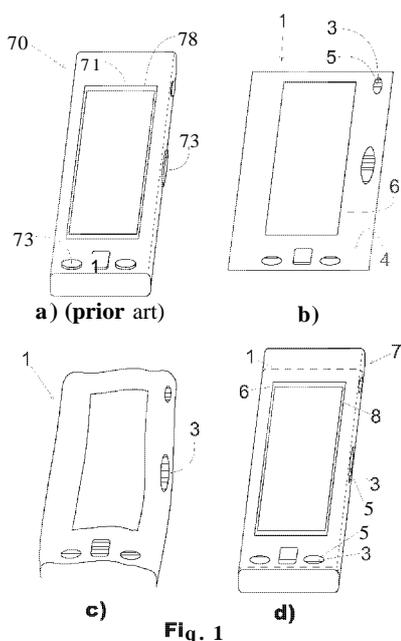
ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.1 7(H))
- of inventorship (Rule 4.17(iv))

[Continued on next page]

(54) Title: TOUCH SENSITIVE FILM, TOUCH SENSING DEVICE, AND ELECTRONIC DEVICE



(57) Abstract: A touch sensitive film (1) comprises a conductive layer (2) having a touch sensing region (3), and a user input surface (4). The user input surface of the touch sensitive film comprises a tactilely distinguishable surface feature (5) deviating from the general nature of the user input surface (4) for identifying the location of the touch sensing region (3) by sensing the tactilely distinguishable surface feature.

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A. See extra sheet, amended

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06F, H03K, B81C, B82B, H01L, C01B, B82Y

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

FI, SE, NO, DK

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI, BIOSIS, COMPDX, EMBASE, INSPEC, MEDLINE, PUBCOMP, PUBSUBS, TDB, NPL, XP3GPP, XPAIP, XPESP, XPESP2, XPETSI, XPI3E, XPIEE, XPIETF, XPIOP, XPIPCOM, XPJPEG, XPMISC, XPOAC, XPRD, XPTK, Internet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category* *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 201 0242274 A 1 (ROSENFELD DANIEL [US] et al.) 30 September 2010 (30.09.2010) paragraphs [0004], [0035], [0038]-[0039], [0043], [0048], [0059]-[0060], [0065], [0068], [0079], [0099]; Figs. 1-2, 4-15, 18, 23-26	1, 3-13, 15-18
X	US 2005052426 A 1 (HAGERMOSER E SCOTT [US] et al.) 10 March 2005 (10.03.2005) the whole document, especially paragraphs [0002], [0025], [0028], [0038]-[0039], [0048]; Figs. 1-5	1, 3-13, 15-18
X	WO 201 1107665 A 1 (CANATU OY [FI]) 09 September 2011 (09.09.2011) the whole document, especially abstract; page 6, line 16; page 14, lines 16-37; page 15, lines 1-32; page 18, line 23; Figs. 1-8	1-18

 Further documents are listed in the continuation of Box C.
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2825832 A 1 (SIEMENS AUTOMOTIVE SA [FR]) 13 December 2002 (13.12.2002) Figs. 1-2 & abstract [online] EPOQUENET EPODOC & WPI & machine translation into English by EPO & Google [online] [retrieved on 2013-04-16], the whole document	
A	DE 2020090001 39 U 1 (IRLBACHER BLICKPUNKT GLAS GMBH [DE]) 12 May 2010 (12.05.2010) Figs. 1-10 & abstract [online] EPOQUENET EPODOC & WPI & machine translation into English by EPO & Google [online] [retrieved on 2013-04-16], the whole document, especially paragraphs [0032], [0039]	
A	US 2009058687 A 1 (ROTHKOPF FLETCHER [US] et al.) 05 March 2009 (05.03.2009) the whole document	
A	US 4 197439 A (MECKLENBURG ALFRED C [US] et al.) 08 April 1980 (08.04.1980) the whole document	
A	US 201 0048250 A 1 (JIANG KAI-LI [CN] et al.) 25 February 2010 (25.02.2010) the whole document	
A	CN 10 1893954 A (GUANGDONG RESINK CONDUCTIVE COATING CO LTD) 24 November 2010 (24.11.2010) 6 abstract [online] EPOQUENET EPODOC & WPI & machine translation into English by SIPO [online] [retrieved on 2013-04-24], the whole document	
A	Canatu Oy: Nanobud revolutionises car control, article on Tekes website [online], June 22, 2011 [retrieved on 2013-04-12]. Retrieved from the Internet <URL: <a href="http://www.tekes.fi/en/community/Success_stories/416/Success_story/667?name=Nanobud+revolutionises+car+control">http://www.tekes.fi/en/community/Success_stories/416/Success_story/667?name=Nanobud+revolutionises+car+control</a> > the whole document	
A	US 201 1109586 A 1 (RIP BOJAN [US] et al.) 12 May 2011 (12.05.2011) the whole document, especially paragraphs [0113]-[0114]; Fig. 10b	
A	GB 2 161 122 A (LEYLAND VEHICLES) 08 January 1986 (08.01.1986) the whole document, especially abstract; Figs. 1-2	
P, A	US 201 2 111491 A 1 (HUANG LILI [US] et al.) 10 May 2012 (10.05.2012) the whole document	
E	US 201 30791 39 A 1 (GRAY SHAWN [US]) 28 March 2013 (28.03.2013) the whole document	1, 15-16

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.  
PCT/FI201 2/050936

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 201 0242274 A 1	30/09/201 0	AU 201 023491 2 A 1	13/1 0/201 1
		AU 201 0260482 A 1	22/09/201 1
		CA 2753697 A 1	23/1 2/201 0
		CA 2753903 A 1	14/1 0/201 0
		CN 102378955 A	14/03/201 2
		CN 102378956 A	14/03/201 2
		EP 241 4921 A2	08/02/201 2
		EP 2443535 A 1	25/04/201 2
		JP 20 125223 17 A	20/09/201 2
		JP 20 12530964 A	06/1 2/201 2
		KR 201 20004978 A	13/01/201 2
		KR 201 20037366 A	19/04/201 2
		MX 201 10 10290 A	08/1 2/201 1
		MX 201 10 10298 A	11/1 0/201 1
		US 201 0245246 A 1	30/09/201 0
		WO 20 10 117664 A2	14/1 0/201 0
WO 20 10 147692 A 1	23/1 2/201 0		
US 2005052426 A 1	10/03/2005	AT 5 14596 T	15/07/201 1
		AU 2004272504 A 1	24/03/2005
		CN 1845839 A	11/1 0/2006
		CN 100522698 C	05/08/2009
		EP 1663720 A2	07/06/2006
		EP 1663720 B 1	29/06/201 1
		JP 2007504983 A	08/03/2007
		JP 20 11108269 A	02/06/201 1
		KR 2006007361 4 A	28/06/2006
		WO 2005025942 A2	24/03/2005
WO 201 1107665 A 1	09/09/201 1	CN 102884495 A	16/01/201 3
		CN 102893369 A	23/01/201 3
		EP 2542952 A 1	09/01/201 3
		EP 2543061 A 1	09/01/201 3
		FI 201 052 16 A	06/09/201 1
		TW 201 200468 A	01/01/201 2
		TW 201 203041 A	16/01/201 2
		US 201 2327004 A 1	27/1 2/201 2
		US 201 3050 113 A 1	28/02/201 3
		WO 20 11107666 A 1	09/09/201 1
FR 2825832 A 1	13/1 2/2002	FR 2825832 B 1	12/03/2004

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.  
PCT/FI201 2/050936

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
DE 2020090001 39 U 1	12/05/201 0	EP 2204909 A 1	07/07/20 10
.....			
US 2009058687 A 1	05/03/2009	CN 201 3 15050 Y US 791 0843 B2 US 201 1169667 A 1 US 8330061 B2 WO 2009032898 A2	23/09/2009 22/03/201 1 14/07/201 1 11/1 2/201 2 12/03/2009
.....			
US 4 197439 A	08/04/1 980	CA 113441 6 A 1	26/1 0/1 982
.....			
US 201 0048250 A 1	25/02/201 0	CN 10 14 1951 8 A CN 10 14 1951 8 B CN 10 14 1951 9 A CN 10 14 1951 9 B CN 10 1458593 A CN 10 1458593 B CN 10 1458594 A CN 10 1458594 B CN 10 1458595 A CN 10 1458595 B CN 10 1458596 A CN 10 1458596 B CN 10 1458597 A CN 10 1458597 B CN 10 1458598 A CN 10 1458598 B CN 10 1458599 A CN 10 1458599 B CN 10 1458600 A CN 10 1458600 B CN 10 1458602 A CN 10 1458602 B CN 10 1458603 A CN 10 1458603 B CN 10 1458604 A CN 10 1458604 B CN 10 1458605 A CN 10 1458605 B CN 10 1458606 A CN 10 1458606 B CN 10 1458608 A CN 10 1458608 B CN 10 1458609 A CN 10 1458609 B CN 10 1464759 A	29/04/2009 20/06/201 2 29/04/2009 20/06/201 2 17/06/2009 14/03/201 2 17/06/2009 18/07/201 2 17/06/2009 08/06/201 1 17/06/2009 08/06/201 1 17/06/2009 08/06/201 1 17/06/2009 08/06/201 1 17/06/2009 30/1 1/201 1 17/06/2009 21/1 2/201 1 17/06/2009 08/06/201 1 17/06/2009 28/03/201 2 17/06/2009 30/03/201 1 17/06/2009 20/06/201 2 17/06/2009 28/09/201 1 17/06/2009 09/1 1/201 1 24/06/2009

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.  
PCT/FI201 2/050936

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
		CN 10 1464759 B	20/06/201 2
		CN 10 1464763 A	24/06/2009
		CN 10 1464763 B	29/09/201 0
		CN 10 1470558 A	01/07/2009
		CN 10 1470558 B	21/1 1/201 2
		CN 10 1470559 A	01/07/2009
		CN 10 1470559 B	21/1 1/201 2
		CN 10 1470560 A	01/07/2009
		CN 10 1470560 B	25/01/201 2
		CN 10 1470566 A	01/07/2009
		CN 10 1470566 B	08/06/201 1
		CN 10 1620454 A	06/01/201 0
		CN 10 1655720 A	24/02/201 0
		CN 10 1655720 B	18/07/201 2
		CN 10 1656769 A	24/02/201 0
		CN 10 1656769 B	10/1 0/201 2
		CN 10 1676832 A	24/03/201 0
		CN 10 1676832 B	28/03/201 2
		EP 2053495 A2	29/04/2009
		EP 2053496 A2	29/04/2009
		JP 20091 46420 A	02/07/2009
		JP 4567781 B2	20/1 0/201 0
		JP 20091 57923 A	16/07/2009
		JP 4567782 B2	20/1 0/201 0
		JP 20091 57927 A	16/07/2009
		JP 46951 8 1 B2	08/06/201 1
		JP 20091 464 13 A	02/07/2009
		JP 492781 1 B2	09/05/201 2
		JP 20091 464 12 A	02/07/2009
		JP 49501 7 1 B2	13/06/201 2
		JP 20091 464 16 A	02/07/2009
		JP 4965549 B2	04/07/201 2
		JP 20091 46424 A	02/07/2009
		JP 4965550 B2	04/07/201 2
		JP 20 10257494 A	11/1 1/201 0
		JP 4976529 B2	18/07/201 2
		JP 20091 04576 A	14/05/2009
		JP 20091 04577 A	14/05/2009
		JP 20091 464 10 A	02/07/2009
		JP 20091 464 11 A	02/07/2009
		JP 20091 464 14 A	02/07/2009
		JP 20091 464 15 A	02/07/2009
		JP 20091 464 17 A	02/07/2009
		JP 20091 464 18 A	02/07/2009
		JP 20091 46421 A	02/07/2009
		JP 20091 46423 A	02/07/2009
		JP 20091 5 1781 A	09/07/2009
		JP 20091 5 1782 A	09/07/2009
		JP 20091 57924 A	16/07/2009

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.  
PCT/FI201 2/050936

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
		JP 20091 57925 A	16/07/2009
		JP 20091 63729 A	23/07/2009
		JP 20091 69944 A	30/07/2009
		JP 20 1001 5574 A	21/01/201 0
		JP 20 10049691 A	04/03/201 0
		JP 20 10049692 A	04/03/201 0
		JP 20 10073208 A	02/04/201 0
		JP 20 11 170899 A	01/09/201 1
		KR 2009004 1353 A	28/04/2009
		KR 2009004 1356 A	28/04/2009
		US 20091 53505 A 1	18/06/2009
		US 8 115742 B2	14/02/201 2
		US 20091 6771 0 A 1	02/07/2009
		US 8 125878 B2	28/02/201 2
		US 20091 5351 5 A 1	18/06/2009
		US 8 1991 19 B2	12/06/201 2
		US 20091 67707 A 1	02/07/2009
		US 8237668 B2	07/08/201 2
		US 20091 67708 A 1	02/07/2009
		US 8237669 B2	07/08/201 2
		US 20091 53520 A 1	18/06/2009
		US 8237670 B2	07/08/201 2
		US 20091 53507 A 1	18/06/2009
		US 8237671 B2	07/08/201 2
		US 20091 5351 0 A 1	18/06/2009
		US 8237673 B2	07/08/201 2
		US 20091 5351 2 A 1	18/06/2009
		US 8237674 B2	07/08/201 2
		US 20091 6771 1 A 1	02/07/2009
		US 8237675 B2	07/08/201 2
		US 20091 53502 A 1	18/06/2009
		US 8243029 B2	14/08/201 2
		US 20091 0281 0 A 1	23/04/2009
		US 8248377 B2	21/08/201 2
		US 20091 53506 A 1	18/06/2009
		US 8248379 B2	21/08/201 2
		US 20091 5351 1 A 1	18/06/2009
		US 8248381 B2	21/08/201 2
		US 20091 53521 A 1	18/06/2009
		US 8253700 B2	28/08/201 2
		US 20091 5351 3 A 1	18/06/2009
		US 8253701 B2	28/08/201 2
		US 201 0048254 A 1	25/02/201 0
		US 8260378 B2	04/09/201 2
		US 20091 5351 4 A 1	18/06/2009
		US 8325585 B2	04/1 2/201 2
		US 834631 6 B2	01/01/201 3
		US 20091 53503 A 1	18/06/2009
		US 836301 7 B2	29/01/201 3

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.  
PCT/FI201 2/050936

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
		US 20091 53504 A 1	18/06/2009
		US 841 1044 B2	02/04/201 3
		US 20091 0 1488 A 1	23/04/2009
		US 20091 5351 6 A 1	18/06/2009
		US 20091 59 188 A 1	25/06/2009
		US 20091 60799 A 1	25/06/2009
		US 201 0001 975 A 1	07/01/201 0
		US 201 0073322 A 1	25/03/201 0
		US 201 2273 124 A 1	01/1 1/201 2
		US 201 2279052 A 1	08/1 1/201 2
.....			
CN 10 1893954 A	24/1 1/201 0	CN 10 1893954 B	28/1 2/20 11
.....			
US 201 1109586 A 1	12/05/201 1	EP 249701 7 A 1	12/09/201 2
		US 201 1109572 A 1	12/05/201 1
		US 8350820 B2	08/01/201 3
		US 201 1109560 A 1	12/05/201 1
		US 201 1109573 A 1	12/05/201 1
		US 201 1109574 A 1	12/05/201 1
		US 201 1109587 A 1	12/05/201 1
		US 201 1113371 A 1	12/05/201 1
		US 201 2 162542 A 1	28/06/201 2
		WO 20 11057076 A 1	12/05/201 1
.....			
GB 2 16 1122 A	08/01/1 986	GB 841 6877 DO	08/08/1 984
.....			
US 201 2 11 1491 A 1	10/05/201 2	CN 10254 1345 A	04/07/201 2
		CN 202486736 U	10/1 0/201 2
		TW 201 2384 16 A	16/09/201 2
.....			
US 201 30791 39 A 1	28/03/201 3	CN 10301 9435 A	03/04/201 3
		CN 202838259 U	27/03/201 3
		EP 2573667 A2	27/03/201 3
.....			

## CLASSIFICATION OF SUBJECT MATTER

**Amended**

Int.Cl.

**G06F 3/041** (2006.01 )**H03K 17/96** (2006.01 )**B82Y 15/00** (201 1.01 )**G06F 1/16** (2006.01 )**G06F 3/0354** (201 3.01 )**B81C 1/00** (2006.01 )**B82Y 30/00** (201 1.01 )**C01B 31/02** (2006.01 )**B82Y 40/00** (201 1.01 )