



(51) International Patent Classification:
G06F 3/047 (2006.01) **G06F 3/044** (2006.01)

(21) International Application Number:
PCT/IL2009/000455

(22) International Filing Date:
30 April 2009 (30.04.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/071,458 30 April 2008 (30.04.2008) US
61/136,049 8 August 2008 (08.08.2008) US

(71) Applicant (for all designated States except US): **N-TRIG LTD.** [IL/IL]; 15 Atir Yeda Street, 2nd Floor, 44643 Kfar-Saba (IL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZACHUT, Rafi** [IL/IL]; 10 NaAma Street, 75684 Rishon-LeZion (IL). **PERS-KI, Haim** [IL/IL]; 27 Mazal Arie Street, 45309 Hod-HaSharon (IL). **MOORE, Jonathan** [IL/IL]; 3 Recanati Street, 69494 Tel-Aviv (IL).

(74) Agents: **G.E. EHRLICH (1995) LTD.** et al.; 11 Menachem Begin Street, 52521 Ramat Gan (IL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

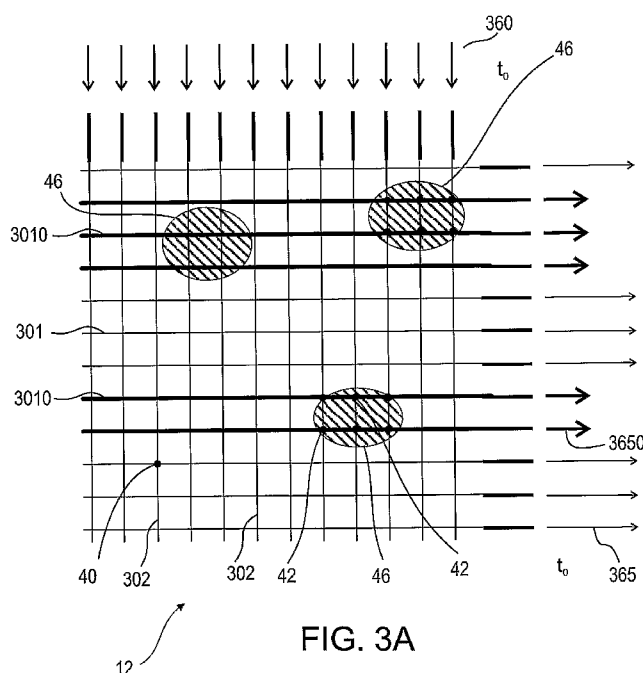
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,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

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: MULTI-TOUCH DETECTION



(57) Abstract: A method for multi-touch detection in a touch input device comprising a grid based sensor, the method comprises sampling outputs from a grid based sensor over a first stage of detection, selecting sensor lines based on the sampled outputs, scanning the selected sensor lines along one axis of the grid based sensor over a second stage of detection, and determining positions of user interaction based on outputs sampled in response to scanning the selected sensor lines during the second stage of detection.



(88) Date of publication of the international search report:

6 May 2010

INTERNATIONAL SEARCH REPORT

International application No

PCT/IL2009/000455

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/047 G06F3/044

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)

G06F

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000 259351 A (KEYENCE CO LTD) 22 September 2000 (2000-09-22) abstract & "Online translation of JP2000259351" 22 September 2000 (2000-09-22), Retrieved from the Internet: URL: http://dossier1.ipdl.inpit.go.jp/AIPN/aipn_call_transl.ipdl?N0000=7413&N0120=01&N2001=2&N3001=2000-259351 [retrieved on 2009-09-08] paragraphs [0010] - [0013]; figure 1	1-23, 36-44
Y	JP 07 110741 A (DIGITAL KK) 25 April 1995 (1995-04-25) abstract -/--	1-23, 36-44

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search

25 September 2009

Date of mailing of the international search report

16/03/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Cohen, Benjamin

INTERNATIONAL SEARCH REPORT

International application No

PCT/IL2009/000455

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	& "Online translation of JP07110741" 25 April 1995 (1995-04-25), Retrieved from the Internet: URL:http://dossier1.ipdl.inpit.go.jp/AIPN/ aipn_call_transl.ipdl?N0000=7413&N0120=01& N2001=2&N3001=H07-110741> [retrieved on 2009-09-08] paragraphs [0045], [0046] -----	
A	AU 2008 100 002 A4 (APPLE INC) 7 February 2008 (2008-02-07) abstract paragraph [0042] -----	7
A	US 2007/171211 A1 (PERSKI HAIM [IL] ET AL) 26 July 2007 (2007-07-26) abstract paragraph [0222] - paragraph [0228]; figure 16 -----	13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL2009/000455

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1-23, 36-44 (in part)
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-23, 36-44

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-23, 36-44 (in part)

From the description, the alleged invention appears to be based on triggering input lines along a first axis of touch input device comprising a grid based sensor. The outputs along the other axis are sensed and the active outputs are then triggered in their turn and the outputs along the first axis sensed, to give the result.

Presently none of the claims appears to comprise this combination of features, causing the claims to lack technical support from the description, contrary to the requirements of PCT Art. 6 (support). Moreover, the claims comprise vague terms, contrary to the requirements of PCT Art. 6 (clarity), like in claim 1: 'sampling ... over a first stage of detection', 'selecting ... based on the sampled outputs'; and in claim 44: '...regions in which may have interactions...', 'scanning ... to localize the position...'. Moreover the dependence of the claims is very confusing as almost all dependent claims refer back to all previous claims, irrespective of whether they referred to claims relate to the same embodiment or are in fact technically compatible. This further adds to the unclarity of the claims.

This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claim (PCT Guidelines 9.19 and 9.20).

The search was consequently restricted to the alleged invention described above and in the light of the description, eg. page 17, line 26 - page 18, line 29, and page 25, line 1-14.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2)PCT declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23, 36-44

Multi-touch detection in a touch input device comprising a grid based sensor using a first sampling, followed by a scanning of lines selected on the basis of the results of the first sampling and then sampling outputs.

2. claims: 24-35

Multi-touch detection in a touch input device comprising a grid based sensor, using a first touch detection and, if an ambiguity exists in the result, carrying out a second touch detection to resolve the ambiguity.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IL2009/000455

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2000259351 A	22-09-2000	NONE	
JP 7110741 A	25-04-1995	JP 3349223 B2	20-11-2002
AU 2008100002 A4	07-02-2008	CN 101632060 A	20-01-2010
		CN 201293982 Y	19-08-2009
		DE 202007018134 U1	30-04-2008
		EP 2111572 A2	28-10-2009
		HK 1108273 A2	02-05-2008
		US 2008158167 A1	03-07-2008
		WO 2008085719 A2	17-07-2008
US 2007171211 A1	26-07-2007	US 2008218494 A1	11-09-2008
		US 2004155871 A1	12-08-2004