

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
22 January 2009 (22.01.2009)

PCT

(10) International Publication Number
WO 2009/010312 A1

(51) International Patent Classification:
H04M 1/725 (2006.01)

(21) International Application Number:
PCT/EP2008/050310

(22) International Filing Date: 11 January 2008 (11.01.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/777,387 13 July 2007 (13.07.2007) US

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(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, 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, 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).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report

(54) Title: SYSTEM, DEVICE AND METHOD FOR TRANSMITTING A FILE BY USE OF A THROWING GESTURE TO A MOBILE TERMINAL

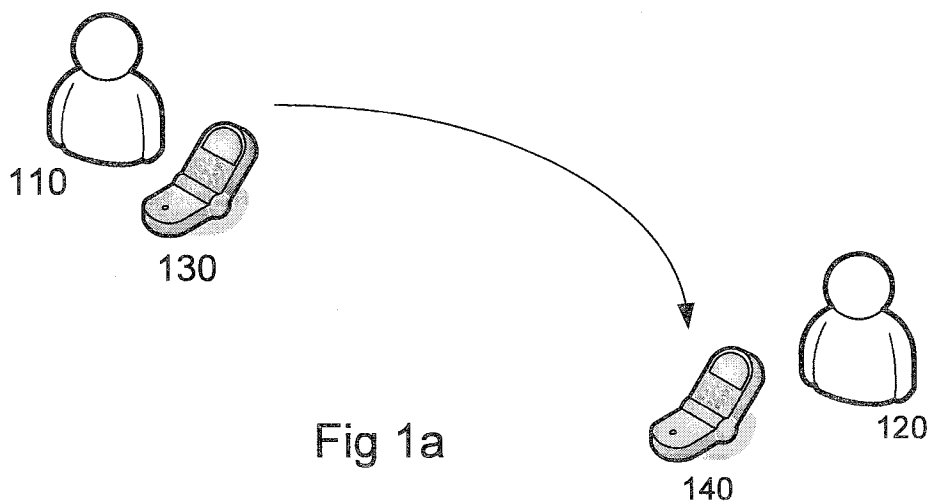


Fig 1a

(57) Abstract: A method and a system for transmitting a selected file from a transmitting mobile terminal (130) to a receiving mobile terminal (140) are provided. A user (110) selects a file, such as a picture, a message, e-payments or the like, gets a good grip of the mobile terminal, and makes a throwing gesture towards a desired receiver of the selected file. The throwing gesture is detected and converted into analogue/digital signals. The signals are then transferred and used to control/steer the functionality of the mobile terminal in accordance therewith.

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SYSTEM, DEVICE AND METHOD FOR TRANSMITTING A FILE BY USE
OF A THROWING GESTURE TO A MOBILE TERMINAL

5 TECHNICAL FIELD

The present invention relates generally to a mobile terminal, and more particularly to transmit a file from a mobile terminal.

10 BACKGROUND ART

The first commercially attractive mobile telephones or terminals were introduced in the market at the end of the 1980'. Since then, the mobile communication industry has had an enormous development both regarding quality of
15 service and transmission capabilities, as well as the technology for simplifying the handling of the applications within the mobile telephone or terminal. A lot of efforts have been made in making more intuitive handled applications within mobile telephones or
20 terminals. One application or service that is mostly awkward and non intuitive for most users to handle is to share a file on a mobile telephone. To be able to share a file it requires you to firstly turn on Bluetooth/WIFI/IR on your mobile phone, then to browse up the unit you want
25 to connect to and share your file with. You also have to know that the unit you are about to connect with is actually the right one (the names are not always that intuitive). This is especially a problem in an environment with lots of mobile terminals or if you are
30 interacting from some distance. Next step is to select the file you wish to share and finally to send the selected file to the selected terminal.

SUMMARY OF THE INVENTION

With the above and following description in mind,
then an aspect of some embodiments of the present
5 invention is to provide an improved system and a method
for sharing/sending/transmitting files in an easy and
intuitive way, which seeks to mitigate, alleviate or
eliminate one or more of the above-identified
deficiencies in the art and disadvantages singly or in
10 any combination.

An aspect of the present invention relates to a
method for transmitting a selected file from a
transmitting mobile terminal to a receiving mobile
15 terminal. The method comprises the steps of identifying a
position of the transmitting mobile terminal, identifying
positions of mobile terminals which are nearby the
transmitting mobile terminal by use of the identified
position of the transmitting mobile phone, identifying a
20 throwing gesture of the transmitting mobile terminal,
identifying the receiving mobile terminal by use of the
throwing gesture and the identified positions of mobile
terminals nearby and transmitting the file to the
identified receiving mobile terminal.

25

The throwing gesture may be identified by use of an
accelerometer, pedometer, camera or video call camera
comprised in the transmitting mobile terminal. Further,
the throwing gesture may be identified by detecting
30 changes in position of the transmitting mobile terminal
by use of GPS positioning or radar.

The direction of the throwing gesture may be identified and then the receiving mobile terminal may be identified by using the direction. The direction of said throwing gesture is identified by use of acceleration of
5 said throwing gesture.

The step of transmitting the file may further comprise initiating the transmitting process by pressing an option key before making the throwing gesture and
10 finishing the transmitting process by releasing the option key after making the throwing gesture.

The position of mobile terminals nearby the transmitting mobile terminal may be identified by use of
15 a positioning method. The positioning method may comprise one of GPS positioning, radar, Bluetooth signalling, IR signalling, WiFi, GSM, signal strength triangulation or a combination thereof. If the transmitting mobile terminal is positioned indoors the positioning method may also
20 comprise the method of using last known GPS position in combination with an accelerometer, GPS-free indoor location tracking method or Rosum indoor position technology.

25 Another aspect of the present invention relates to a system for transmitting a selected file between a transmitting mobile terminal and a receiving mobile terminal by use of a throwing gesture. The transmitting terminal comprises a control unit that is operatively
30 connected to a movement detector unit. The movement detector unit is adapted to identify the throwing gesture and the control unit is adapted to transmit the file from

the transmitting mobile terminal to the receiving mobile terminal in accordance with the identified throwing gesture.

- 5 The movement detector may comprise an inertial guidance/navigation system for assessing acceleration and direction of the identified throwing gesture. Further, the movement detector may comprise one or a combination of an accelerometer, pedometer, camera or video call
10 camera.

- The transmitting mobile terminal may comprise an accelerometer or a camera for assessing a direction of the identified throwing gesture. The movement detector
15 may comprise a gyroscope for assessing direction of the identified throwing gesture.

- The transmitting mobile terminal may also comprises an option key suitable as a trigger before making the
20 throwing gesture and after making the throwing gesture.

- Further, the transmitting mobile terminal may comprise a positioning system. The positioning system may comprises one of GPS system, radar system, Bluetooth
25 signalling system, IR signalling system, WiFi system, GSM system, a system using signal strength for positioning, a system using triangulation for positioning or a combination thereof.

- 30 If the transmitting mobile terminal is positioned indoors the positioning system may comprise a system using last known GPS position in combination with an

accelerometer.

Still another aspect of the present invention relates to a mobile terminal for transmitting a selected file by
5 use of a throwing gesture. The terminal comprises a control unit that is operatively connected to a movement detector unit. The movement detector unit is adapted to identify the throwing gesture and the control unit is adapted to transmit the file in accordance with the
10 identified throwing gesture. Further a mobile terminal for receiving the file sent by the mobile terminal for transmitting may be provided.

The terminology used herein is for the purpose of
15 describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms of "a", "an" and "the" are intended to include plural forms as well, unless the context clearly indicates otherwise. It should be emphasised that the
20 terms "comprises/comprising" when used in this specification are taken to specify the presence or addition of one or more other features, element, integers, steps, components or groups thereof.

25 BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features and advantages of the present invention will become apparent from the following detailed description of the invention, wherein
embodiments of the invention will be described in more
30 detail with reference to the accompanying drawings, in which:

FIG. 1a-d shows a mobile terminal in several

embodiments of the invention;

FIG 2 shows a mobile terminal equipped with an inertial guidance/navigation system according to one embodiment of the invention.

5

DETAILED DESCRIPTION

Embodiments of the present invention relate to the field of sharing files and, more particularly to the field of sharing files between mobile terminals. A preferred embodiment relates to an application for sharing files between portable electronic devices, such as a mobile telephone phone or terminal. However, it should be appreciated that the invention is as such equally applicable to electronic devices such as a Personal Communication System terminal in the form of a Smartphone that may combine a cellular radiotelephone with data processing, facsimile and data communications capabilities; a personal digital assistant (PDA) or a Pocket PC that can include a radiotelephone, pager, Internet/Intranet access, Web browser, organizer and/or calendar; and a conventional laptop and/or palmtop receiver or other appliance that includes a radio-telephone transceiver. However, for the sake of clarity and simplicity, most embodiments outlined in this specification are related to mobile phones.

Embodiments of the present invention will be described more fully hereinafter with reference to the accompanying drawings, in which embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.

Rather, these embodiments are provided so that this disclosure will be thorough and complete, and fully convey to the scope of the invention to those skilled in the art. Like reference signs refer to like elements
5 throughout.

An intuitive way of sharing/sending/transmitting files is if a user who wants to share/send/transmit a file makes a throwing gesture towards another user with whom the user wishes to share/send/transmit the file. The
10 technical solution to achieve this is dependent on several technologies working together.

Figs 1a-d illustrates several ways of sharing files
15 between two or more portable electronic devices or mobile terminals by use of a throwing gesture.

Fig 2 shows schematically a mobile terminal 130 according to the invention comprises a moving detector unit 210, a control unit 220 and a transmitting unit 230,
20 both operatively connected to the moving detector unit 210 and a receiving unit 240. The moving detector unit 210 is adapted to detect and track different changes in both position and motion of the mobile terminal. The
25 control unit 220 is adapted to control the functionality of the mobile terminal in accordance with these detected changes creating different data depending on the type of change, e.g. change of position. The transmitting unit is adapted to share/send/transmit files and the receiving
30 unit is adapted to receive files. The mobile terminal 100 according to the invention may also comprise an option key 250 that may be operatively connected to the moving

detector 210 and/or the control unit 220. In Fig 2, the means for moving the mobile terminal 100 is the hand of the user.

5 The mobile terminal 100 according to the invention may also comprise a display 260 and/or a key pad 270, a battery 280, an antenna 290, a radio unit 310, a loudspeaker 320, a microphone 330, and a camera 340, as shown in Fig 2, but this is known technology and will not
10 be explained in further detail. All of these components may of course be located at any other suitable position in relation to each other but these relative positioning in the mobile terminal is of no importance for the invention and will not be explained any further.

15

 In one embodiment, a user selects a file, such as a picture, a message, e-payments or the like, gets a good grip of the mobile terminal, and makes a throwing gesture towards a desired receiver of the selected file. The term
20 "throwing gesture" is intended to describe a manner of simulating the propelling of an object through the air by swinging the arm and making a simulated gesture of forwarding the object in a direction towards an intended receiver, such as throwing a ball through the air. There
25 are several ways of throwing things through the air, such as throwing a Frisbee, a javelin, a basket ball among others. Each throw has a specific path, depending on what and how the user throws. The throwing gesture is detected and converted into analogue/digital signals by the moving
30 detector unit. The signals are then transferred and used by the control unit 220 to control/steer the functionality of the mobile terminal in accordance

therewith.

The moving detector unit 210 may comprise an inertial guidance/navigation system which detects the velocity,
5 acceleration and/or direction of the throwing gesture by use of one or several accelerometers or a camera 230 and/or gyroscopes.

The inertial guidance/navigation system integrates
10 the information gathered from the combination of gyroscopes and accelerometers or camera in order to determine the current state of the system.

Gyroscopes measure the angular velocity of the
15 system, in this case the mobile terminal, in the inertial reference frame, in this case the courtyard, room or other well defined spaces. Based on this information, the direction is known but not the velocity of the system.

20 Accelerometers measure the linear acceleration of the system in the inertial reference frame, but in directions that can only be measured relative the moving system, in this case the mobile terminal. The accelerometers may be replaced by a camera and a software solution for enabling
25 real-time motion-control.

However, by detecting both the current angular velocity of the system and the current linear acceleration of the system measured relative to the
30 moving system, it is possible to determine the linear acceleration of the system in the inertial reference frame.

By performing integration/calculation on the inertial accelerations (using the original velocity) using the kinematical equations yields the inertial velocity of the mobile terminal and integration/calculation again (using the original position) yields the inertial position of the mobile terminal.

As an example, if the initial direction is known, as the position of the receiver, the initial velocity is known, the velocity of the throwing gesture, and if it is possible to keep track of both how the terminal would turn, accelerate and decelerate, is it possible to calculate the current orientation, position and velocity the terminal would have had if they were thrown away for real.

The method according the present invention comprises following steps:

1. Identifying the positions of the units outdoor and indoors
2. Receiving the positions of other units in vicinity to the present unit
3. Identifying a throwing gesture
4. Identifying the direction of the throwing gesture
5. Sending/transmitting a selected file

The identification of the position of units outdoor and indoors may be performed in several different ways.

In identification of positions outdoors, following alternatives may be used:

- each mobile terminal may use GPS positioning;
- mobile terminals, which are connected to certain tele base stations, may turn on Bluetooth/WiFi and/or sharing via internet via an event from the base station and/or acknowledge units that are close to each other;
- the signal strength may be used to provide the correct position on where a unit is as means for e.g. accounting where there are buildings;
- triangulation of signals from other units via Bluetooth/WIFI and/or base stations, e.g. GSM; or
- a WiFi-based location platform, called PlaceEngine, has been developed where the WiFi signal information is used as a location detection method. This method may be used to estimate the position of mobile device's both indoor and outdoors.

In identification of positions indoors, following alternatives may be used:

- each mobile terminal may use GPS positioning;
- the position of each mobile terminal may be identified by using Rosum indoor position technology, or similar;
- the position may be computed using GPS-free indoor location tracking method, which has been developed and that provides knowledge of the geometric location nodes in a MANET (mobile ad hoc network) using RSSI (received signal strength indication);
- the signal strength may be used to provide the correct position on where a unit is as means for e.g. accounting if a unit is in a room or where

there is a wall;

- triangulation of signals from other units via Bluetooth /WIFI and/or base stations, e.g. GSM may also be used to provide the position of the units;
- 5 - the method using PlaceEngine, as described above, may be used to estimate the position of mobile device's;
- radar may be used to identify the position of the unit and detect where there are walls and use this
- 10 information to account for which units that are in the vicinity; or
- the last known GPS position in combination with an accelerometer or a camera may be used to be able to backtrack positions on the basis of distance
- 15 walked.

The method according to the invention uses one or several in combination of these technologies to identify the position of the units.

20

Further, receiving positions of units in vicinity may be done in several different ways, such as:

- the position may be sent via internet (GPRS/HSDPA) to a server that automatically
- 25 broadcasts to units that are within throw range, based on distance in database accounting for buildings, acknowledge units that they are close to each other; or
- all mobile terminals within Bluetooth/WIFI
- 30 range may send their position to each other, which means that the user knows his position relative to other mobile terminals.

The identification of a throwing gesture may be performed by using an accelerometer or pedometer. Additionally, the mobile terminal may be using its camera
5 or video call camera to detect motion, a throwing gesture. Further alternative may be to use GPS to identify a throwing gesture since a throwing gesture is changes, such as motion and/or altitude changes in a direction, of position of the mobile terminal. Radar may
10 also be used to identify a throwing gesture as detection of motion of the mobile terminal.

Further, the direction of the throwing gesture may be identified by using an accelerometer or pedometer.
15 Additionally, the mobile terminal may be using its camera or video call camera to detect motion and thus estimate the direction of the throwing gesture. Further alternative may be to use GPS to estimate the direction of the throwing gesture since a throwing gesture is a
20 change, such as motion and/or altitude changes in a direction, of position of the mobile terminal. Radar may also be used to estimate the direction of the throwing gesture by using its ability to detect motion of the mobile terminal.

25

In one embodiment the file is sent at the end of the throwing gesture, via GPRS/HSDPA and/or Bluetooth/WiFi. In another embodiment the file is sent when the end of the throwing gesture is triggered with a specific ending
30 movement, which is identified by means of a camera, video call camera, accelerometer or pedometer, GPS or WiFi. In one embodiment the ending movement is a typical stop

movement or a slowing down of the throwing gesture. In another embodiment the end movement is a trigger action, such as pushing a button or releasing a button. In a further embodiment the end movement is a tilting movement
5 of the mobile terminal in a certain direction.

The users may configure their own throwing gestures and end movements. As an example, if the user likes to throw Frisbees, the user might configure the throwing
10 gesture and end movement as if the user where throwing a Frisbee. The user may also add specific sound effects, both on the throwing gesture and on the end movement.

Moreover, the actual direction of the throwing
15 gesture is not used when assessing the throw but merely using the movement of a throwing gesture and vicinity information for e.g. sending a file to a computer or someone in the contact list in the mobile terminal.

20 In one embodiment it is possible to send to several units if they are closely positioned.

Several different technical solutions with varying accuracy, such as that the user actually hits the right
25 person, security, such as certain files may requiring better accuracy, e.g. DRM protected, or files that requires privacy, may be used.

The arrows in fig 1a-d not directly associated with
30 numerals shows schematically movements simulated by the user's hand.

In a first embodiment of the invention, as shown in fig 1a, a person, a user 110, wants to share or send a picture, a file, to another person, a receiver 120.

Initially, the user 110 selects a file in a mobile phone

5 130. Further, the user 110 makes a throwing gesture with the mobile phone 130 towards the receiver 120. As the event is triggered, the user may hear a sound, e.g.

"swoosh" and/or may feel a tactile feedback in the mobile phone 130. The mobile phone 140 of the receiver 120 may

10 vibrate and the receiver may hear a sound like the receiver catches a ball (timed like a real physical throw towards the user).

If a user 110 "misses the target", as shown in fig

15 1b, the user 110 and/or the receiver 120 may e.g. hear a crashing sound. The receiver 120 gets a message about whether the receiver 120 would like to "pick up", accept, the file or not. If the receiver presses yes, the file is transmitted to the mobile phone 140.

20

In another embodiment of the invention the user is positioned in vicinity of a building, as shown in fig 1c. Initially, a user 110 selects a file and makes a throwing gesture with the mobile phone towards the wall 130 on the

25 building. The user may hear a bouncing sound as the file "hits" the wall and then continues to the friend 120.

In yet another embodiment of the invention the user wants to transfer a file from the mobile phone to a

30 computer nearby, as shown in fig 1d. Initially, a user 110 select a file, makes a throwing gesture with the mobile phone 130 towards the computer 140. The computer

blinks to confirm that the file has been transferred.

CLAIMS

1. A Method for transmitting a selected file from a transmitting mobile terminal (130) to a receiving mobile terminal (140), comprising the steps of:

- 5 - identifying a position of said transmitting mobile terminal (130);
- identifying positions of mobile terminals which are nearby said transmitting mobile terminal (130) by use of said identified position of said transmitting mobile
- 10 phone (130) ;
- identifying a throwing gesture of said transmitting mobile terminal (130);
- identifying said receiving mobile terminal (140) by use of said throwing gesture and said identified
- 15 positions of mobile terminals nearby; and
- transmitting said file to said identified receiving mobile terminal (140).

2. The method according to claim 1, wherein said

20 throwing gesture is identified by use of an accelerometer, pedometer, camera or video call camera comprised in said transmitting mobile terminal (130).

3. The method according to claim 1, wherein said

25 throwing gesture is identified by detecting changes in position of said transmitting mobile terminal (130) by use of GPS positioning or radar.

4. The method according to claim 1, further

30 comprising the steps of:

- identifying a direction of said throwing gesture, wherein said receiving mobile terminal is identified by

using said direction.

5 5. The method according to claim 4, wherein said direction of said throwing gesture is identified by use of acceleration of said throwing gesture.

10 6. The method according to claim 1, wherein said step of transmitting said file further comprises initiating said transmitting process by pressing an option key (250) before making said throwing gesture and finishing said transmitting process by releasing said option key after making said throwing gesture.

15 7. The method according to claim 1, wherein said position of mobile terminals nearby said transmitting mobile terminal (130) is identified by use of a positioning method.

20 8. The method according to claim 7, wherein said positioning method comprises one of GPS positioning, radar, Bluetooth signalling, IR signalling, WiFi, GSM, signal strength triangulation or a combination thereof.

25 9. The method according to claim 7, wherein said transmitting mobile terminal (130) is positioned indoors and said positioning method comprises using last known GPS position in combination with an accelerometer.

30 10. The method according to claim 7, wherein said transmitting mobile terminal (130) is positioned indoors and said positioning method comprises GPS-free indoor location tracking method or Rosum indoor position

technology.

11. A system for transmitting a selected file between
a transmitting mobile terminal (130) and a receiving
5 mobile terminal (140) by use of a throwing gesture,
wherein said transmitting terminal comprises

- a control unit (220) that is operatively connected
to a movement detector unit (210), wherein said movement
detector unit is adapted to identify said throwing
10 gesture and said control unit is adapted to transmit said
file from said transmitting mobile terminal to said
receiving mobile terminal in accordance with said
identified throwing gesture.

12. The system according to claim 11, wherein said
15 movement detector unit (210) comprises an inertial
guidance/navigation system for assessing acceleration and
direction of said identified throwing gesture.

13. The system according to claim 11, wherein said
20 movement detector unit (210) comprises one or a
combination of an accelerometer, pedometer, camera or
video call camera.

14. The system according to claim 11, wherein said
25 transmitting mobile terminal (130) comprises an
accelerometer or a camera for assessing a direction of
said identified throwing gesture.

15. The system according to claim 11, wherein said
30 movement detector comprises a gyroscope for assessing
direction of said identified throwing gesture.

16. The system according to claim 11, wherein said transmitting mobile terminal (130) comprises an option key (250) suitable as a trigger before making said
5 throwing gesture and after making said throwing gesture.

17. The system according to claim 11, wherein said transmitting mobile terminal (130) comprises a positioning system.
10

18. The system according to claim 17, wherein said positioning system comprises one of GPS system, radar system, Bluetooth signalling system, IR signalling system, WiFi system, GSM system, a system using signal
15 strength for positioning, a system using triangulation for positioning or a combination thereof.

19. The system according to claim 17, wherein said transmitting mobile terminal (130) is positioned indoors
20 and said positioning system comprises a system using last known GPS position in combination with an accelerometer.

20. The system according to claim 17, wherein said transmitting mobile terminal (130) is positioned indoors
25 and said positioning system comprises GPS-free indoor location tracking system or Rosum indoor position system.

21. A mobile terminal (130) for transmitting a selected file by use of a throwing gesture, comprising:
30 - a control unit (220) that is operatively connected to a movement detector unit (210), wherein said movement detector unit is adapted to identify said throwing

gesture and said control unit is adapted to transmit said file in accordance with said identified throwing gesture.

22. A mobile terminal for receiving a file sent by a
5 mobile terminal according to claim 21.

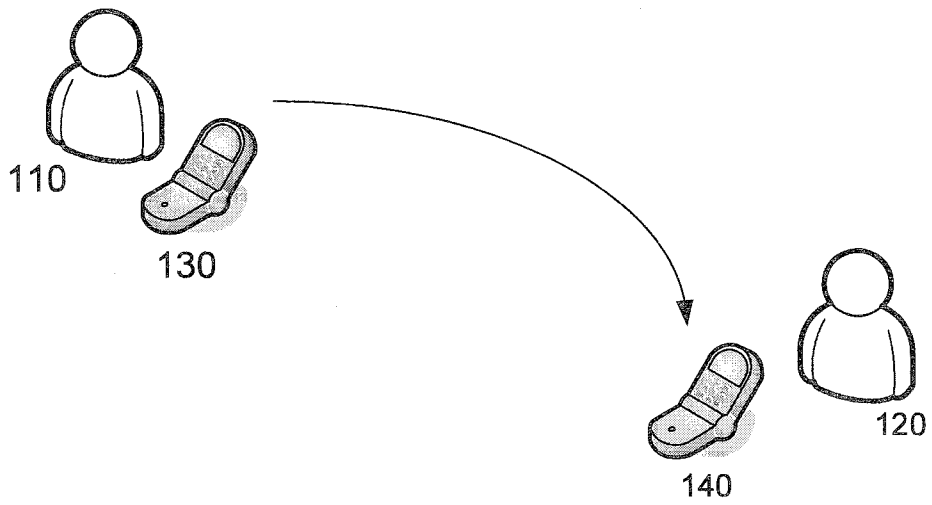


Fig 1a

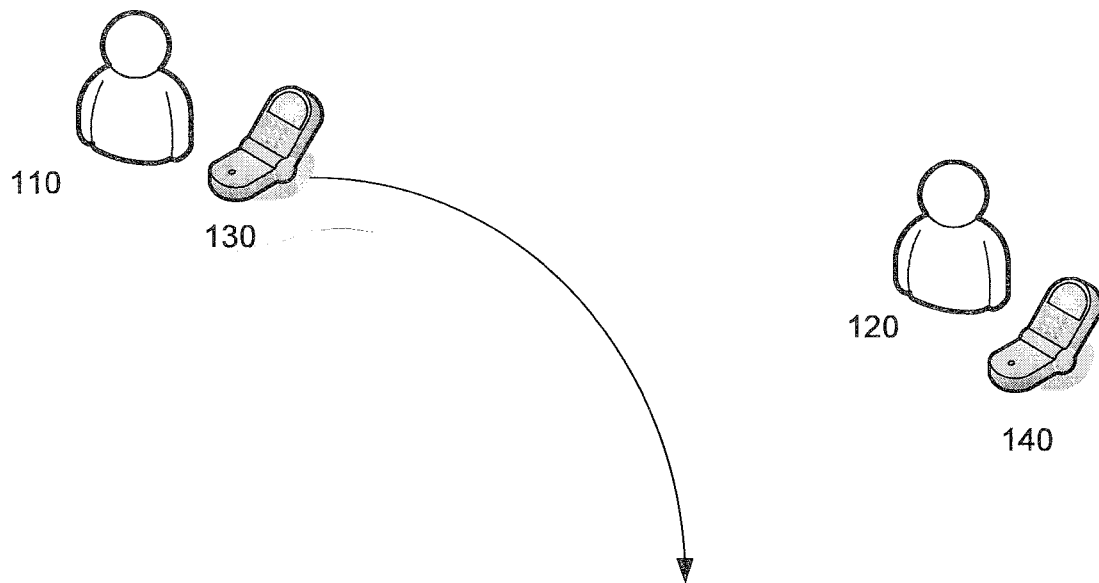


Fig 1b

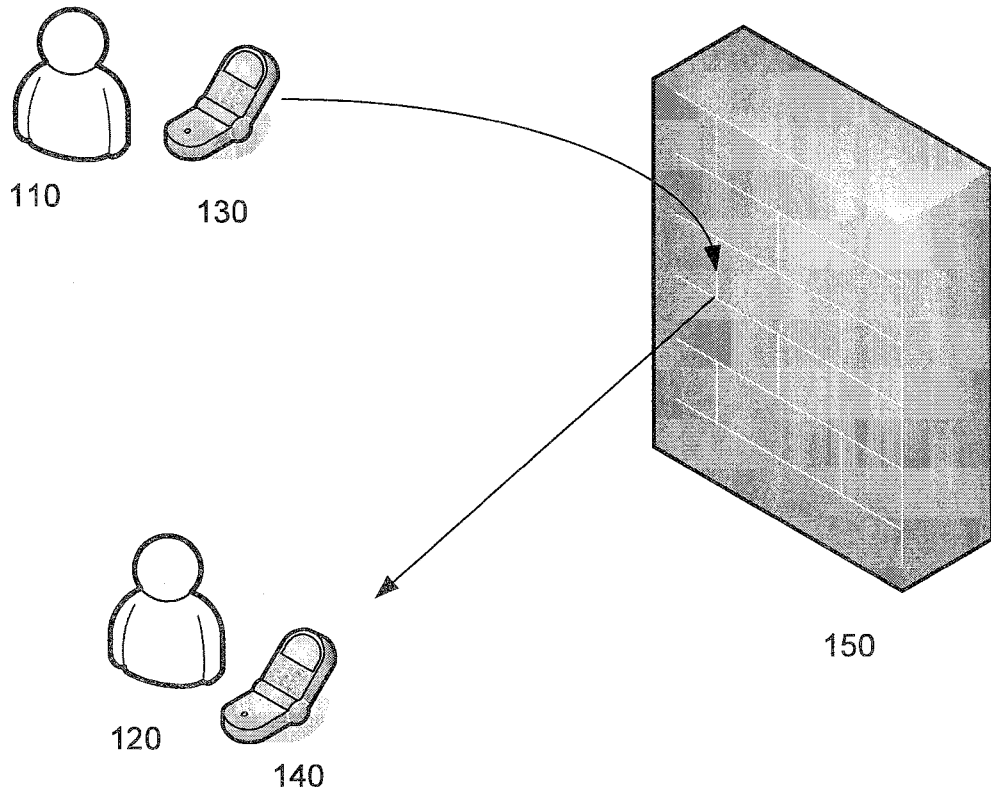


Fig 1c

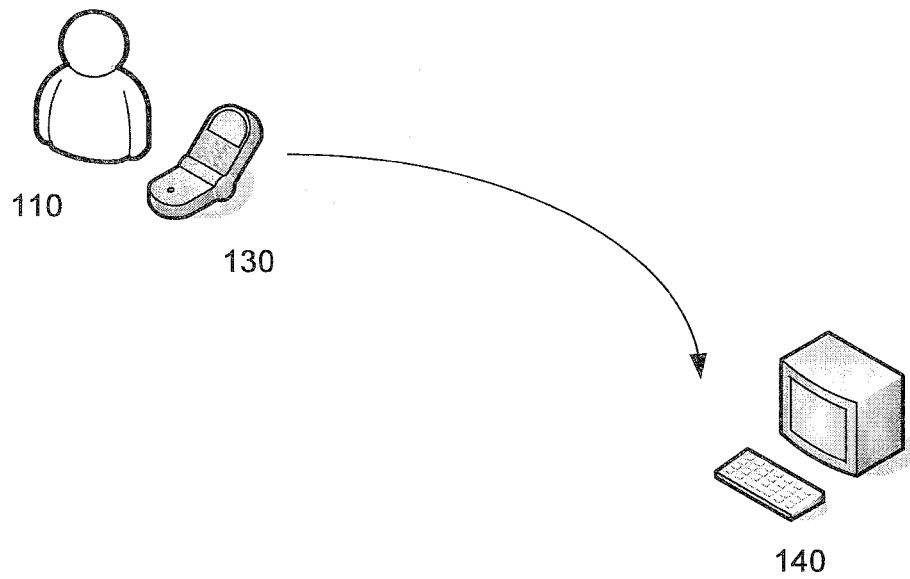


Fig 1d

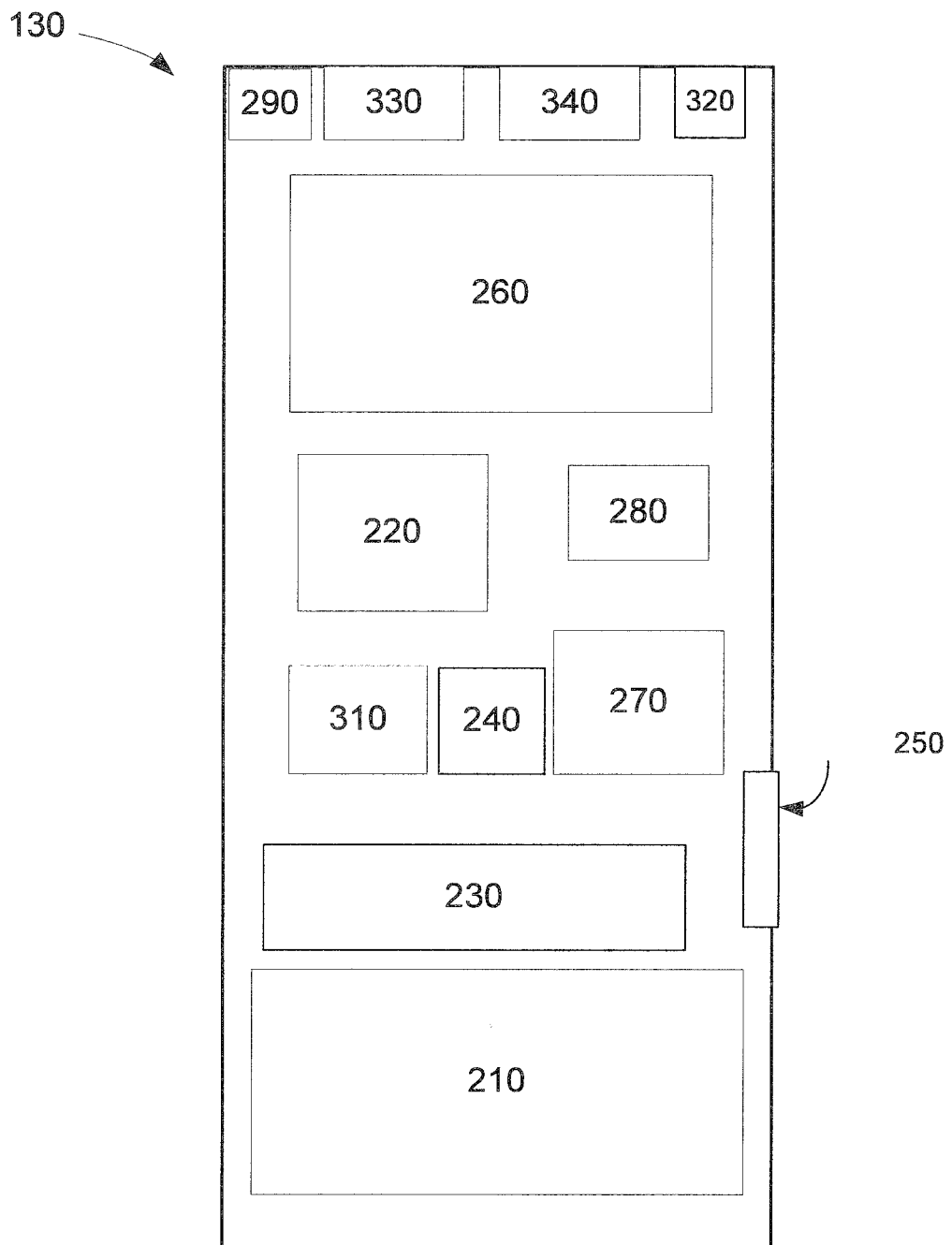


Fig 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/050310

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04M1/725

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)
H04M G06F H04L

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/256074 A1 (KRUM DAVID M [US] ET AL) 16 November 2006 (2006-11-16) paragraph [0012] - paragraph [0021]; figure 1 paragraph [0032] - paragraph [0037]; figures 2,3	11-15, 21,22
Y		1-10, 16-20
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☒ 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
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Date of the actual completion of the international search

18 April 2008

Date of mailing of the international search report

25/04/2008

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2008/050310

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2004/075169 A (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS CORP [US]; VAN DE SLUIS B) 2 September 2004 (2004-09-02) page 1, line 17 - page 2, line 2 page 5, line 18 - line 32; figure 1 page 8, line 14 - line 19 page 10, line 27 - line 32; figure 3 page 12, line 1 - page 13, line 31; figures 5,6 -----	1-10, 16-20
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