



(51) International Patent Classification:

G06F 3/0488 (2013.01) G06F 3/0485 (2013.01)
G06F 3/0481 (2013.01) G06F 3/0484 (2013.01)
G06F 3/0482 (2013.01)

(21) International Application Number:

PCT/IB2015/001251

(22) International Filing Date:

17 June 2015 (17.06.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

201410306810.X 30 June 2014 (30.06.2014) CN

(71) Applicant: ALCATEL LUCENT [FR/FR]; 148/152 route de la Reine, F-92100 Boulogne-Billancourt (FR).

(72) Inventors: **WANG, Futang**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **CHEN, Jiongxuan**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **ZHANG, Hongbo**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **PEI, Yunbo**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **NI, Na**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **ZHI, Leitao**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **GAO, Meng**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN). **YIN, Dacheng**; 388# Ningqiao Road, Pudong Jinqiao, Shanghai 201206 (CN).

(74) Agent: SCIAUX, Edmond; Alcatel-lucent International, 148/152 route de la Reine, F-92100 Boulogne-Billancourt (FR).

(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, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, 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, SA, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, 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, KM, ML, MR, NE, SN, TD, TG).

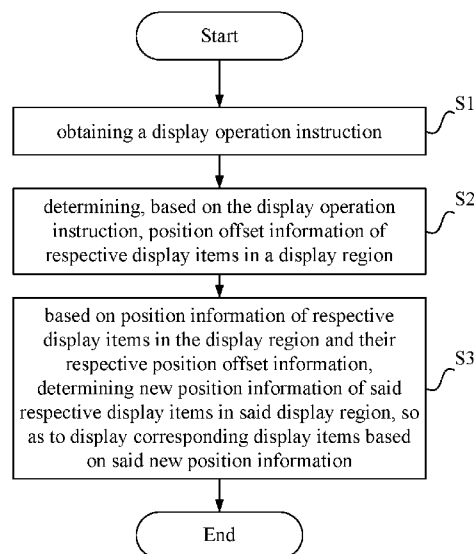
Published:

— with international search report (Art. 21(3))

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR DISPLAYING AN OPERATION ON A TOUCH SCREEN OF A DEVICE

Fig.1



(57) Abstract: An objective of the present invention is to provide a method and apparatus for displaying an operation on a touch screen of a device. The method according to the present invention comprises steps of: obtaining a display operation instruction; determining, based on the display operation instruction, position offset information of respective display items in a display region; based on position information of respective display items in the display region and their respective position offset information, determining new position information of said respective display items in said display region, so as to display corresponding display items based on said new position information, wherein an initial position of said display region is a succession of its end position, while said end position is a preamble of said initial position.





-
- *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))*

Description

Method and Apparatus for Displaying an Operation on a Touch Screen of a Device

5

FIELD OF THE INVENTION

The present invention relates to the field of computer technologies, and more specifically to a method and apparatus for displaying an operation on a touch screen of a device.

10

BACKGROUND OF THE INVENTION

In the prior art, with the development of a touch-screen device, some touch screens have become larger and larger. When a user performs an operation such as clicking on an application icon in the screen or inputting textual information in a device having a larger touch screen, the user needs to perform relevant operations with cooperation of two hands at many times. Because if only one hand is used, the operation can only be performed in the screen by thumb, but the reach of thumb is very limited.

SUMMARY OF THE INVENTION

An objective of the present invention is to provide a method and apparatus for displaying an operation on a touch screen of a device.

According to one aspect of the present invention, there is provided a method for displaying an operation on a touch screen of a device, wherein the method comprises steps of:

- a. obtaining a display operation instruction;
- b. determining, based on the display operation instruction, position offset information of respective display items in a display region;
- c. based on position information of respective display items in the display region and their respective position offset information, determining

new position information of said respective display items in said display region, so as to display corresponding display items based on said new position information, wherein an initial position of said display region is a succession of its end position, while said end position is a preamble of said initial position.

According to one aspect of the present invention, there is further provided a presenting apparatus for displaying an operation on a touch screen of a device, wherein the presenting apparatus comprises:

an operation obtaining device configured to obtain a display operation instruction;

a determining device configured to determine, based on the display operation instruction, position offset information of respective display items in a display region;

a displaying device configured to, based on position information of respective display items in the display region and their respective position offset information, determine new position information of said respective display items in said display region, so as to display corresponding display items based on said new position information, wherein an initial position of said display region is a succession of its end position, while said end position is a preamble of said initial position.

Compared with the prior art, the present invention has the following advantages: the solution according to the present invention is applicable to various applications without a need of changing its application layer and is thus easily implemented. Moreover, the solution according to the present invention has a certain continuity with an original presenting mode, such that the user needn't readapt a new presenting mode, which enhances user experience; the solution according to the present invention enables the user to complete various operations in a touch screen device with a larger screen by displaying the display region in a top-bottom connected manner, e.g., in a

cylindrical display pattern. For example, for a traditional display pattern based on a touch screen mobile phone, because the screen is very large, it might be very difficult for the user to use a thumb of one hand to click onto a picture at the utmost top of the touch screen of the mobile phone; while
5 based on the solution of the present invention, the user can slip the screen of the mobile phone with one hand, such that the icon that is originally displayed at the top of the screen is scrolled to an appropriate position in the screen for being presented; therefore, it is much easier to click onto the icon using a thumb of one hand.

10

Brief Description of the Accompanying Drawings

Through reading detailed description of the non-limiting embodiments with reference to the following accompanying drawings, other features, objectives, and advantages of the present invention will become more
15 apparent:

Fig. 1 schematically shows a flow diagram of a method for displaying an operation on a touch screen of a device;

Fig. 2 schematically shows a schematic diagram of a presenting apparatus for displaying an operation on a touch screen of a device;

20

Fig. 3 schematically shows an exemplary displaying interface according to the present invention;

Fig. 4 schematically shows another exemplary displaying interface according to the present invention;

25

Fig. 5 schematically shows a further exemplary displaying interface according to the present invention;

In the accompanying drawings, same or like reference numerals represent same or similar components.

Detailed Description

30

Hereinafter, the present invention will be described in further detail

with reference to the accompanying drawings.

Fig. 1 schematically shows a flow diagram of a method for displaying according to the present invention, wherein the method according to the present invention comprises step S1, step S2, and step S3.

Wherein, the method according to the present invention is implemented through a presenting apparatus included in a touch-screen device. The touch-screen device includes, but not limited to, any kind of electronic product that may perform human-machine interaction by finger(s) or other object touching a touch screen of a device display, e.g., a touch-screen mobile phone, a touch-screen tablet computer, a touch-screen laptop, a touch-screen game machine, etc.

It should be noted that the touch-screen intelligent devices are only examples, and other existing or future possibly emerging touch-screen devices, if applicable to the present invention, should also be included within the protection scope of the present invention, and are incorporated here by reference.

With reference to Fig. 1, in step S1, a presenting apparatus obtains a display operation instruction.

Wherein, the display operation instruction includes, but not limited to, an operation instruction of moving display item(s) currently having been displayed in a display region of the touch screen.

Wherein, the display item includes, but not limited to, to-be-drawn respective objects in the display region. Preferably, the display item includes, but not limited to, at least any one of the following:

- 1) to-be-drawn respective pixel points in the display region;
- 2) objects drawn by drawing functions corresponding to respective applications, e.g., application icons, user interfaces of the applications, etc., and for further examples, a desktop wallpaper, etc.

Preferably, the display operation instruction includes, but not limited to, movement direction and movement distance information when the user operates on a touch screen.

Wherein, the movement direction includes, but not limited to, up,
5 down, left, right, and inclination, etc.

Specifically, the presenting apparatus determines a corresponding display operation instruction based on the user's touch operation on the touch screen.

Preferably, step S1 according to the present invention includes step
10 S101 (not shown) and step S102 (not shown).

In step S101, a presenting apparatus receives input instruction information.

Wherein, the input instruction information includes various kinds of instruction information that may be input by the user based on the touch
15 screen. For example, click, double click, slide, long press, etc.

Next, in step S102, the presenting apparatus determines whether the current input instruction information is a display operation instruction based on a predetermined input rule.

Wherein, the predetermined input rule is for determining, based on
20 one or more input instruction information, whether the currently received input instruction information is a display operation instruction.

Preferably, the predetermined input rule includes: when an rule-out instruction has been previously received before the input instruction information, determine that the received input instruction information is
25 not a display operation instruction, wherein the rule-out instruction includes a predetermined operation for ruling out a subsequent input instruction from being a display operation instruction.

Wherein, the rule-out instruction could be determined based on the user operation, or, based on the default setting in the operating system.

Preferably, the predetermined input rule includes: based on one or more preset non-display operation instruction, deciding whether the received input instruction information is a non-display operation instruction.

5 For example, the user presets, in a device, the following two non-display operation instructions:

Instruction A: double click, long press and slide after the second click;

Instruction B: circling, then long pressing and sliding.

10 Then, when the presenting apparatus receives input instruction information “double click, long press and slide after the second click,” the presenting apparatus determines that it matches instruction A and determines that the input instruction information is a non-display operation instruction.

15 Preferably, the user may set a required predetermined input rule based on its own use habit and/or actual need.

More preferably, if the presenting apparatus decides being not a display operation instruction, transmits it to an operating system, such that a corresponding executing module responds to the input instruction
20 information.

For example, the predetermined rule comprises: if a rule-out instruction “double click” has been received, then the subsequent input instruction is not a display operation instruction. Then when the presenting apparatus receives input instruction information “sliding down
25 10 pixels” in step S101, the presenting apparatus decides whether a previously received input instruction information is a “double click” instruction, and when determining that the previously received input instruction information is a “double click,” it decides that the current input instruction information is not a display operation instruction, and

transmits the input instruction information to the operating system, such that the operating system performs a corresponding operation based on an actual operation object corresponding to the input instruction information, e.g., the scroll bar as currently displayed, i.e., scrolling down the scroll
5 bar by 10 pixels. For a further example, with a predetermined input rule as mentioned above, the presenting apparatus receives input instruction information “moving 20 pixels to the right” in step S101, and the presenting apparatus determines that the previous input instruction information is not a “double-click” operation, then the presenting
10 apparatus decides that the input instruction information is display operation information, and performs a subsequent operation based on the display operation information.

Next, in step S2, the presenting apparatus determines position offset information of respective display items in a display region based on the
15 display operation instruction.

Wherein, the position offset information includes a lateral offset amount and/or a longitudinal offset amount based on a display region of a touch screen.

Specifically, the presenting apparatus determines a lateral offset
20 amount and/or a longitudinal offset amount corresponding to respective display items, respectively, based on the moving direction and moving distance indicated by the display operation instruction.

Next, in step S3, based on location information of respective display items in the display region and their respective position offset
25 information, the presenting apparatus determines new position information of the respective display items in the display region, so as to display corresponding display items based on the new location information.

Herein, an initial position of the display region is a succession to its

end position, while the end position is a preamble of the initial position. In other words, respective display items displayed in the current display region may be displayed by up-down and/or left-right scrolling in a top-bottom connected manner. preferably, the top-down connected
5 manner may be implemented using a plurality of effects, e.g., implemented using a cylindrical scroll effect.

Wherein, the initial position includes a lateral initial position and/or a longitudinal initial position; the end position includes a lateral end position and/or a longitudinal end position.

10 Wherein, the lateral initial position is an initial point of all position information having a same longitudinal coordinate value in a display region, while the lateral end position is an end point of all position information having a same longitudinal coordinate value in the display region. Similarly, the longitudinal initial position is an initial point of all
15 position information that having a same lateral coordinate value in a display region, while the longitudinal end position is an end point of all position information having a same lateral coordinate value in the display region.

Preferably, the position information is determined based on the
20 lateral coordinate information and the longitudinal coordinate information of the display region, the location offset information including a lateral offset amount and/or a longitudinal offset amount, wherein the step S3 comprises step S301 (not shown) and step S302 (not shown).

25 In step S301, for respective display items, if a sum of lateral/longitudinal coordinate information and a corresponding offset amount is greater than a lateral/ longitudinal region length of the display region, the presenting apparatus determines new lateral/ longitudinal coordinate information based on a sum of the two and a difference between

corresponding region lengths.

In step S302, for respective displaying items, if the sum of the lateral/ longitudinal coordinate information and the lateral/ longitudinal offset amount is less than the lateral/longitudinal initial position coordinate of the display region, then the presenting apparatus determines new lateral/ longitudinal coordinate information based on a difference between the two and a sum of the lateral/ longitudinal region lengths.

Wherein, when the offset direction and the coordinate direction are consistent, the offset amount is a positive value, while when the offset direction is contradictory with the coordinate direction, the offset amount is a negative value.

For example, the current location information of the displaying item is (30, 60), the lateral coordinate scope of the display region is [0, 600], the longitudinal coordinate scope of the display region is [0, 1000], while the lateral offset amount obtained by the presenting apparatus is -40, then the presenting apparatus determines that the new lateral coordinate of the displaying item = $30 - 40 + 600 = 590$. Then, the displaying item is drawn at the new position information (590, 60) of the displaying item.

According to one preferred embodiment of the present invention, the method further comprises step S4 (not shown), while the step S2 further comprises step S201 (not shown).

In step S4, the presenting apparatus obtains a presenting mode determined based on the selection operation.

Wherein, the presenting mode is for presenting display items of the current display region in a specific manner in a top-bottom connected manner.

Next, in step S201, the presenting apparatus determines position offset information of the respective display items in the display region based on the presenting mode and the display operation instruction.

For example, Fig. 3 schematically shows a display region of a touch screen in prior art. Wherein, predetermined selectable modes include “trapezoid mode” and “film mode”. When the user selects “trapezoid mode,” referring to Fig. 4, the display region presents respective display items in the original display region in a manner like a trapezoid. Next, the presenting apparatus obtains display operation information that the user slides up in step S1, then the presenting apparatus determines, based on the display operation information, pixels that need to be slide up based on the display operation information, i.e., longitudinal offset amounts of respective display items, and determines different lateral offset amounts of respective display items corresponding to different longitudinal coordinates based on the “trapezoid mode” so as to finally determine new position information of respective display items, thereby obtaining the display region newly drawn in the trapezoid mode as shown in Fig. 5.

According to a further preferred embodiment of the present invention, the method according to the present invention further comprises step S5 (not shown) and step S6 (not shown).

In step S5, the presenting apparatus obtains operation location information corresponding to a user’s operation behavior.

Wherein, the operation behavior includes other operation behaviors different from the display operation information.

Specifically, the presenting apparatus obtains coordinate information corresponding to the user’s operation behavior with respect to the touch screen.

Next, in step S6, the presenting apparatus determines its corresponding display item based on the operation position information such that the operating system responds to the operation behavior based on the display item.

Specifically, the presenting apparatus determines, based on the

operation position information and the position offset information, original position information corresponding to the operation position information, and determines its corresponding display item based on the original position information, such that the operating system responds to the operation behavior based on the display item.

For example, the presenting apparatus obtains a “single-click” operation behavior at the coordinates (100, 230), and the position offset information obtained by the presenting apparatus is (-50, 120), then the presenting apparatus determines that the original position corresponding to the operation behavior is (50, 350), and transmits the position information to the operating system. The operating system determines that the application corresponding to the original position information (50, 350) is a search app, and initiates the search app to respond to the “click” operation behavior.

Based on a preferred solution of the present invention, the presenting apparatus may determine, based on the user’s setting operation, whether to perform the method according to the present invention. For example, when it is obtained that the user initiates a “one-hand operating mode” in the mobile phone; the presenting apparatus performs steps S1 to S3 so as to facilitate the user to use one hand to operate the mobile phone.

The method according to the present invention is applicable to various applications without a need of changing its application layer and is thus easily implemented. Moreover, the solution according to the present invention has a certain continuity with an original presenting mode, such that the user needn’t adapt a new presenting mode, which enhances user experience; the solution according to the present invention enables the user to complete various operations in a touch screen device with a larger screen by displaying the display region in a top-bottom connected manner, e.g., in a cylindrical display pattern. For example, for

a traditional display pattern based on a touch screen mobile phone, because the screen is very large, it might be very difficult for the user to use a thumb of one hand to click onto a picture at the utmost top of the touch screen of the mobile phone; while based on the solution of the present invention, the user can slip the screen of the mobile phone with one hand, such that the icon that is originally displayed at the top of the screen is scrolled to an appropriate position in the screen for being presented; therefore, it is much easier to click onto the icon using a thumb of one hand.

Fig. 2 schematically shows a schematic diagram of a presenting apparatus for displaying an operation on a touch screen of a device. The presenting apparatus according to the present invention comprises an operation obtaining device 1, a determining device 2, and a displaying device 3.

With reference to Fig. 2, the operation obtaining device 1 obtains a display operation instruction.

Wherein, the display operation instruction includes, but not limited to, an operation instruction of moving display item(s) currently having been displayed in a display region of the touch screen.

Wherein, the display item includes, but not limited to, to-be-drawn respective objects in the display region. Preferably, the display item includes, but not limited to, at least any one of the following:

1) to-be-drawn respective pixel points in the display region;

2) objects drawn by drawing functions corresponding to respective applications, e.g., application icons, user interfaces of the applications, etc., and for further examples, a desktop wallpaper, etc.

Preferably, the display operation instruction includes, but not limited to, movement direction and movement distance information when the user operates on a touch screen.

Wherein, the movement direction includes, but not limited to, up, down, left, right, and inclination, etc.

Specifically, the operation obtaining device 1 determines a corresponding display operation instruction based on the user's touch operation on the touch screen.

Preferably, operation obtaining device 1 according to the present invention includes receiving device (not shown) and deciding device (not shown).

The receiving device receives input instruction information.

Wherein, the input instruction information includes various kinds of instruction information that may be input by the user based on the touch screen. For example, click, double click, slide, long press, etc.

Next, the deciding device determines whether the current input instruction information is a display operation instruction based on a predetermined input rule.

Wherein, the predetermined input rule is for determining, based on one or more input instruction information, whether the currently received input instruction information is a display operation instruction.

Preferably, the predetermined input rule includes: when a rule-out instruction has been previously received before the input instruction information, determine that the received input instruction information is not a display operation instruction.

Wherein, the rule-out instruction includes a predetermined operation for ruling out a subsequent input instruction from being a display operation instruction.

Wherein, the rule-out instruction could be determined based on the user operation, or, based on the default setting in the operating system.

Preferably, the predetermined input rule includes: based on one or more preset non-display operation instruction, deciding whether the

received input instruction information is a non-display operation instruction.

For example, the user presets, in a device, the following two non-display operation instructions:

5 Instruction A: double click, long press and slide after the second click;

 Instruction B: circling, then long pressing and sliding.

Then, when the receiving device receives input instruction information “double click, long press and slide after the second click,”
10 the deciding device determines that it matches instruction A and determines that the input instruction information is a non-display operation instruction.

Preferably, the user may set a required predetermined input rule based on its own use habit and/or actual need.

15 More preferably, the displaying device according to the present invention also comprises a transmitting device (not shown).

If the deciding device decides being not a display operation instruction, the transmitting device transmits it to an operating system, such that a corresponding executing module responds to the input
20 instruction information.

For example, the predetermined rule comprises: if a rule-out instruction “double click” has been received, then the subsequent input instruction is not a display operation instruction. Then when the receiving device receives input instruction information “sliding down 10 pixels” in
25 step S101, the deciding device decides whether a previously received input instruction information is a “double click” instruction, and when determining that the previously received input instruction information is a “double click,” it decides that the current input instruction information is not a display operation instruction. Next, the transmitting device

transmits the input instruction information to the operating system, such that the operating system performs a corresponding operation based on an actual operation object corresponding to the input instruction information, e.g., the scroll bar as currently displayed, i.e., scrolling down the scroll
5 bar by 10 pixels. For a further example, with a predetermined input rule as mentioned above, the receiving device receives input instruction information “moving 20 pixels to the right”, and the presenting apparatus determines that the previous input instruction information is not a “double-click” operation, then the deciding device decides that the input
10 instruction information is display operation information, and the presenting apparatus performs a subsequent operation based on the display operation information.

Next, the determining device 2 determines position offset information of respective display items in a display region based on the
15 display operation instruction.

Wherein, the position offset information includes a lateral offset amount and/or a longitudinal offset amount based on a display region of a touch screen.

Specifically, the determining device 2 determines a lateral offset
20 amount and/or a longitudinal offset amount corresponding to respective display items, respectively, based on the moving direction and moving distance indicated by the display operation instruction.

Next, based on location information of respective display items in the display region and their respective position offset information, the
25 displaying device 3 determines new position information of the respective display items in the display region, so as to display corresponding display items based on the new location information.

Herein, an initial position of the display region is a succession to its end position, while the end position is a preamble of the initial position.

In other words, respective display items displayed in the current display region may be displayed by up-down and/or left-right scrolling in a top-bottom connected manner. preferably, the top-down connected manner may be implemented using a plurality of effects, e.g.,
5 implemented using a cylindrical scroll effect. Wherein, the initial position includes a lateral initial position and/or a longitudinal initial position; the end position includes a lateral end position and/or a longitudinal end position.

Wherein, the lateral initial position is an initial point of all position
10 information having a same longitudinal coordinate value in a display region, while the lateral end position is an end point of all position information having a same longitudinal coordinate value in the display region. Similarly, the longitudinal initial position is an initial point of all position information that having a same lateral coordinate value in a
15 display region, while the longitudinal end position is an end point of all position information having a same lateral coordinate value in the display region.

Preferably, the position information is determined based on the lateral coordinate information and the longitudinal coordinate
20 information of the display region, the location offset information including a lateral offset amount and/or a longitudinal offset amount, wherein the displaying device 3 comprises coordinate determining device (not shown).

For respective display items, if a sum of lateral/ longitudinal
25 coordinate information and a corresponding offset amount is greater than a lateral/ longitudinal region length of the display region, then the coordinate determining device determines new lateral/ longitudinal coordinate information based on a sum of the two and a difference between corresponding region lengths.

For respective displaying items, if the sum of the lateral/longitudinal coordinate information and the lateral/longitudinal offset amount is less than the lateral/longitudinal initial position coordinate of the display region, then the coordinate determining device determines
5 new lateral/longitudinal coordinate information based on a difference between the two and a sum of the lateral/longitudinal region lengths.

Wherein, when the offset direction and the coordinate direction are consistent, the offset amount is a positive value, while when the offset direction is contradictory with the coordinate direction, the offset amount
10 is a negative value.

For example, the current location information of the displaying item is (30, 60), the lateral coordinate scope of the display region is [0, 600], the longitudinal coordinate scope of the display region is [0, 1000], while the lateral offset amount obtained by the presenting apparatus is -40, then
15 the coordinate determining device determines that the new lateral coordinate of the displaying item = $30 - 40 + 600 = 590$. Then, the displaying item is drawn at the new position information (590, 60) of the displaying item.

According to one preferred embodiment of the present invention, the
20 presenting apparatus further comprises a mode obtaining device(not shown), while the determining device further comprises a sub-determining device (not shown).

The mode obtaining device obtains a presenting mode determined based on the selection operation.

Wherein, the presenting mode is for presenting display items of the
25 current display region in a specific manner in a top-bottom connected manner.

Next, the sub-determining device determines position offset information of the respective display items in the display region based on

the presenting mode and the display operation instruction.

For example, Fig. 3 schematically shows a display region of a touch screen in prior art. Wherein, predetermined selectable modes include “trapezoid mode” and “film mode”. When the user selects “trapezoid mode,” referring to Fig. 4, the display region presents respective display items in the original display region in a manner like a trapezoid. Next, the operation obtaining device 1 obtains display operation information that the user slides up, then the sub-determining device determines, based on the display operation information, pixels that need to be slide up based on the display operation information, i.e., longitudinal offset amounts of respective display items, and determines different lateral offset amounts of respective display items corresponding to different longitudinal coordinates based on the “trapezoid mode”, such that the displaying device 3 finally determine new position information of respective display items, thereby obtaining the display region newly drawn in the trapezoid mode as shown in Fig. 5.

According to a further preferred embodiment of the present invention, the presenting apparatus according to the present invention further comprises a position obtaining device (not shown) and a display determining device (not shown).

The position obtaining device obtains operation location information corresponding to a user's operation behavior.

Wherein, the operation behavior includes other operation behaviors different from the display operation information.

Specifically, the position obtaining device obtains coordinate information corresponding to the user's operation behavior with respect to the touch screen.

Next, the display determining device determines its corresponding display item based on the operation position information such that the

operating system responds to the operation behavior based on the display item.

Specifically, the display determining device determines, based on the operation position information and the position offset information, original position information corresponding to the operation position information, and determines its corresponding display item based on the original position information, such that the operating system responds to the operation behavior based on the display item.

For example, the position obtaining device obtains a “single-click” operation behavior at the coordinates (100, 230), and the position offset information obtained by the determining device 2 is (-50, 120), then the display determining device determines that the original position corresponding to the operation behavior is (50, 350), and transmits the position information to the operating system. The operating system determines that the application corresponding to the original position information (50, 350) is a search app, and initiates the search app to respond to the “click” operation behavior.

Based on a preferred solution of the present invention, the presenting apparatus may determine, based on the user’s setting operation, whether to perform the method according to the present invention. For example, when it is obtained that the user initiates a “one-hand operating mode” in the mobile phone, the presenting apparatus performs said operations, from the operation of obtaining display operation instruction to the operation of determines new position information of the respective display items in the display region based on location information of respective display items in the display region and their respective position offset information, so as to facilitate the user to use one hand to operate the mobile phone.

The solution according to the present invention is applicable to

various applications without a need of changing its application layer and is thus easily implemented. Moreover, the solution according to the present invention has a certain continuity with an original presenting mode, such that the user needn't adapt a new presenting mode, which enhances user experience; the solution according to the present invention enables the user to complete various operations in a touch screen device with a larger screen by displaying the display region in a top-bottom connected manner, e.g., in a cylindrical display pattern. For example, for a traditional display pattern based on a touch screen mobile phone, because the screen is very large, it might be very difficult for the user to use a thumb of one hand to click onto a picture at the utmost top of the touch screen of the mobile phone; while based on the solution of the present invention, the user can slip the screen of the mobile phone with one hand, such that the icon that is originally displayed at the top of the screen is scrolled to an appropriate position in the screen for being presented; therefore, it is much easier to click onto the icon using a thumb of one hand.

To those skilled in the art, it is apparent that the present invention is not limited to the details of the above exemplary embodiments, and the present invention may be implemented with other embodiments without departing from the spirit or basic features of the present invention. Thus, in any way, the embodiments should be regarded as exemplary, not limitative; the scope of the present invention is limited by the appended claims, instead of the above depiction. Thus, all variations intended to fall into the meaning and scope of equivalent elements of the claims should be covered within the present invention. No reference signs in the claims should be regarded as limiting the involved claims. Besides, it is apparent that the term "comprise" does not exclude other units or steps, and singularity does not exclude plurality. A plurality of units or modules

stated in a system claim may also be implemented by a single unit or module through software or hardware. Terms such as the first and the second are used to indicate names, but do not indicate any particular sequence.

Claim

1. A method for displaying an operation on a touch screen of a device, wherein the method comprises steps of:

- 5 a. obtaining a display operation instruction;
- b. determining, based on the display operation instruction, position offset information of respective display items in a display region;
- c. based on position information of respective display items in the display region and their respective position offset information,
- 10 determining new position information of said respective display items in said display region, so as to display corresponding display items based on said new position information, wherein an initial position of said display region is a succession of its end position, while said end position is a preamble of said initial position.

15

2. The method according to claim 1, wherein the method comprises steps of:

- obtaining a presenting mode determined based on a selection operation;
- 20 wherein, the step b comprises steps of:
- determining, based on said presenting mode and said display operation instruction, position offset information of said respective display items in the display region.

25 3. The method according to claim 1 or 2, wherein the step a further comprises steps of:

- receiving input instruction information;
- deciding, based on a predetermined input rule, whether current

input instruction information is a display operation instruction.

4. The method according to claim 3, wherein the method comprises steps of:

5 - when it is decided not to be a display operation instruction, transmitting the input instruction information to an operating system, such that the operating system responds to the input instruction information by a corresponding performing module.

10 5. The method according to any one of claims 1 to 4, wherein the method further comprises steps of:

 - obtaining position information corresponding to a user's operation behavior;

15 - determining, based on the position information, its corresponding display item, such that the operating system responds to the operation behavior based on said display item.

20 6. The method according to any one of claims 1 to 5, wherein the position information is determined based on lateral coordinate information and longitudinal coordinate information in the display region, the position offset information comprising a lateral offset amount and/or a longitudinal offset amount, wherein the step c comprises steps of:

25 - if a sum of lateral/ longitudinal coordinate information and a corresponding offset amount is greater than a lateral/ longitudinal region length of the display region, then determining new lateral/ longitudinal coordinate information based on a sum of the two and a difference between corresponding region lengths;

 - if the sum of the lateral/ longitudinal coordinate information and the lateral/ longitudinal offset amount is less than the lateral/longitudinal

initial position coordinate of the display region, then determining new lateral/ longitudinal coordinate information based on a difference between the two and a sum of the lateral/ longitudinal region lengths.

5 7. A presenting apparatus for displaying an operation on a touch screen of a device, wherein the presenting apparatus comprises:

an operation obtaining device configured to obtain a display operation instruction;

10 a determining device configured to determine, based on the display operation instruction, position offset information of respective display items in a display region;

15 a displaying device configured to, based on position information of respective display items in the display region and their respective position offset information, determine new position information of said respective display items in said display region, so as to display corresponding display items based on said new position information, wherein an initial position of said display region is a succession of its end position, while said end position is a preamble of said initial position.

20 8. The apparatus according to claim 7, wherein the presenting apparatus comprises:

a mode obtaining device configured to obtain a presenting mode determined based on a selection operation;

wherein, the determining device comprises:

25 a sub-determining device configured to determine, based on said presentation mode and said display operation instruction, position offset information of said respective display items in the display region.

9. The presenting apparatus according to claim 7 or 8, wherein the

operation obtaining device further comprises:

a receiving device configured to receive input instruction information;

a deciding device configured to decide, based on a predetermined input rule, whether current input instruction information is a display operation instruction.

10. The presenting apparatus according to claim 9, wherein the presenting apparatus comprises:

10 a transmission device configured to, when it is decided not to be a display operation instruction, transmitting the input instruction information to an operating system, such that the operating system responds to the input instruction information by a corresponding performing module.

15

11. The presenting apparatus according to any one of claims 7 to 10, wherein the presenting apparatus further comprises:

a position obtaining device configured to obtain position information corresponding to a user's operation behavior;

20 a display determining device configured to determine, based on the position information, its corresponding display item, such that the operating system responds to the operation behavior based said the display item.

25 12. The presenting apparatus according to any one of claims 7 to 11, wherein the position information is determined based on lateral coordinate information and longitudinal coordinate information in the display region, the position offset information comprising a lateral offset amount and/or a longitudinal offset amount, wherein the presenting

apparatus comprises a coordinate determining device, the coordinate determining device is configured to:

- if a sum of lateral/ longitudinal coordinate information and a corresponding offset amount is greater than a lateral/ longitudinal region length of the display region, then determine new lateral/ longitudinal coordinate information based on a sum of the two and a difference between corresponding region lengths;

- if the sum of the lateral/ longitudinal coordinate information and the lateral/ longitudinal offset amount is less than the lateral/longitudinal initial position coordinate of the display region, then determine new lateral/ longitudinal coordinate information based on a difference between the two and a sum of the lateral/ longitudinal region lengths.

Figures

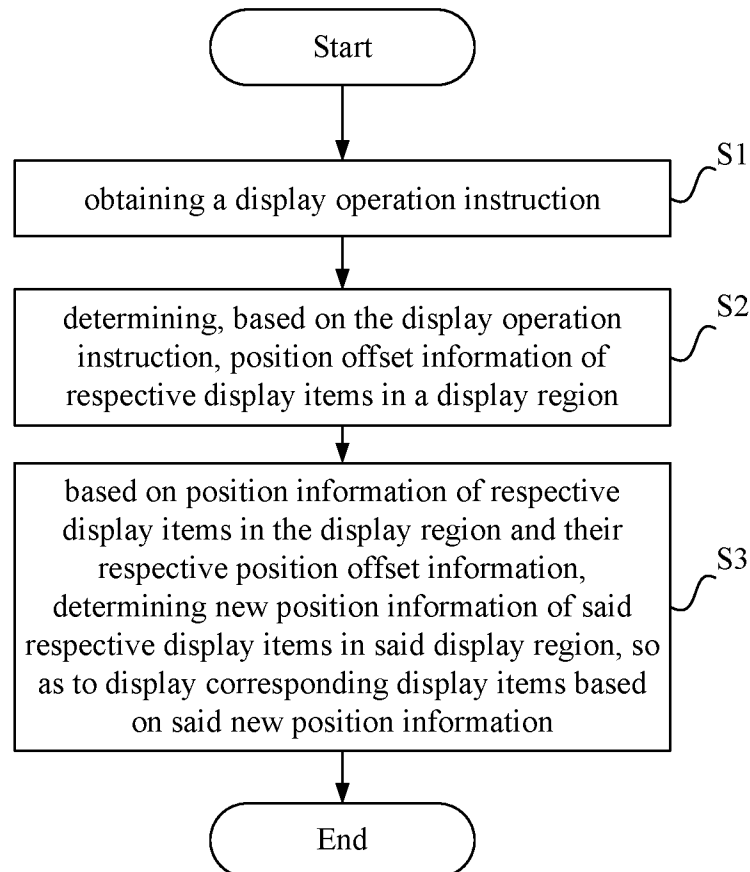


Fig.1

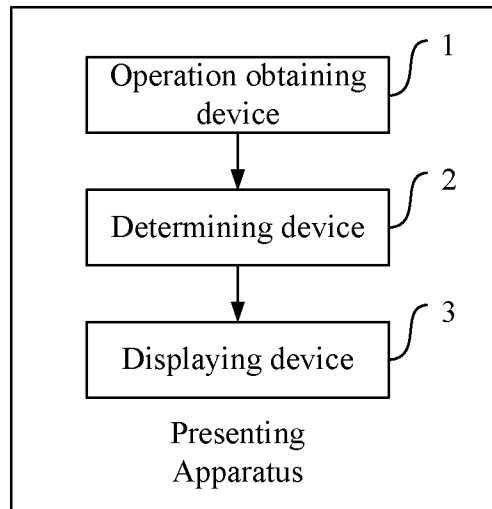


Fig.2



Fig.3



Fig.4



Fig.5

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2015/001251

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/0488 G06F3/0481 G06F3/0482 G06F3/0485 G06F3/0484
ADD.

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 H04M

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)

EP0-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 2010/205563 A1 (HAAPSAARI JONAS-PETTERI [FI] ET AL) 12 August 2010 (2010-08-12) paragraphs [0028] - [0029] paragraphs [0036] - [0039] paragraphs [0050], [0058] figures 1,6A-6C,11A-11D -----	1-12
X	US 2004/100479 A1 (NAKANO MASAO [JP] ET AL) 27 May 2004 (2004-05-27) paragraphs [0017], [0072] paragraphs [0158] - [0162] paragraphs [0230] - [0232] paragraphs [0266] - [0267] figures 2A-2C,13-15,22,23 -----	1-5,7-11



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 application or patent 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

23 November 2015

Date of mailing of the international search report

01/12/2015

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

Guitarte Pérez, J

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2015/001251

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010205563 A1	12-08-2010	AU 2010212007 A1	11-08-2011
		CN 102308271 A	04-01-2012
		CN 104834439 A	12-08-2015
		EP 2394211 A1	14-12-2011
		EP 2940566 A1	04-11-2015
		JP 2012517630 A	02-08-2012
		KR 20110113777 A	18-10-2011
		TW 201033887 A	16-09-2010
		US 2010205563 A1	12-08-2010
		WO 2010089722 A1	12-08-2010

US 2004100479 A1	27-05-2004	CN 1458565 A	26-11-2003
		KR 20030088374 A	19-11-2003
		TW 1238348 B	21-08-2005
		US 2004100479 A1	27-05-2004
