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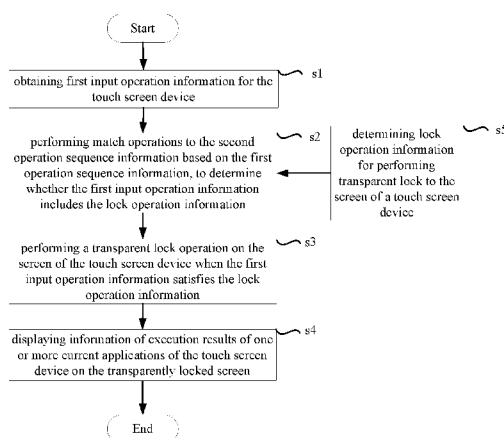
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Fig. 3

(57) **Abstract:** An object of the invention is providing a method and devices for performing a lock operation on a screen of a touch screen device. The locking device determines lock operation information which comprises first operation sequence information for performing transparent lock to a touch screen device, and performs match operations to the first input operation information which comprises second operation sequence information with the first operation sequence information; if the match is successful, the locking device performs a transparent lock operation on the screen of the touch screen device and displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen. Compared with the prior art, the present invention realizes displaying information of execution results of one or more current applications on the transparently locked screen while locking totally (including screen locked and physical button locked) to the touch screen device, such that user operations become more convenient, user needs are satisfied and the user experience is improved.

METHOD AND DEVICE FOR PERFORMING A LOCK OPERATION ON A SCREEN OF A TOUCH SCREEN DEVICE

FIELD OF THE INVENTION

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[0001] The present invention relates to the field of the touch screen device, and in particular to the technology of performing a lock operation on a screen of a touch screen device.

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BACKGROUND OF THE INVENTATION

[0002] Smart devices, especially smart phone, with a touch screen is used widely and exploded in recent years. These devices have a common functionality that is to be locked by short press the power button, so that when the device is locked, the screen is turned off to save power. But sometimes the way of such lock, which also locks and turns off the screen, is not what user exactly wants. For example, user with her little baby is making a video call. But the little baby scratches anywhere on touch screen and may hide or remove the video window, or drop the call unexpectedly. In this case, it will make the conversation impossible that performs the function of the normal lock of the current device, i.e. locking the screen as well as turning off the screen, which does not meet the current requirements of the users.

SUMMARY OF THE INVENTION

[0003] An object of the invention is providing a method and devices for performing a lock operation on a screen of a touch screen device.

[0004] According to one aspect of the invention, a method for performing a lock operation on a screen of a touch screen device is provided, wherein the method comprises:

[0005] x determining lock operation information for performing transparent lock to the screen of a touch screen device, wherein the lock operation information comprises first operation sequence information;

[0006] wherein the method further comprises:

[0007] a. obtaining first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information;

[0008] b. performing match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information;

[0009] c. performing a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled;

[0010] d. displaying information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[0011] According to another aspect of the invention, a locking device for performing a lock operation on a screen of a touch screen device is further provided, wherein the locking device comprises:

5 [0012] lock determining module configured to determine lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information;

[0013] wherein the locking device further comprises:

10 [0014] first obtaining module configured to obtain first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information;

[0015] first matching module configured to perform match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information;

15 [0016] locking module configured to perform a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled;

20 [0017] displaying module configured to display information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[0018] According to another aspect of the invention, a touch screen device for performing a lock operation on a screen is further provided, wherein the device comprises the locking device as aforesaid.

25 [0019] Compared with the prior art, the present invention determines lock operation information which comprises first operation sequence information for performing transparent lock to the screen of a touch screen device, and performs match operations to the first input operation information which comprises second operation sequence information with the first operation sequence information to determine whether the
30 first input operation information includes the lock operation information; then performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled, and displays information of execution results of one or more current applications of the touch screen device on the
35 transparently locked screen. The present invention realizes displaying information of execution results of one or more current applications on the transparently locked screen while locking totally (including screen locked and physical button locked) to the touch screen device, such that user operations become more convenient, user needs are satisfied and the user experience is improved.

40 [0020] Furthermore, the present invention could obtain one or more kinds of association input information associated with a current application of the touch screen device, and obtain information of execution results of the current application based on the association input information, and then display the information of execution results on the transparently locked screen, thereby the present invention may

autonomously activate correlative association input information based on the current application, which satisfies user needs, simplifies user operations, and improves user experience.

5 [0021] Furthermore, the present invention could detect screen state information corresponding to the touch screen device, when the first input operation information satisfies the lock operation information, in conjunction with the screen state information, perform a transparent lock operation on the screen of the touch screen device, thereby the present invention may realize change from a normal lock state to a transparent lock state or from a normal state to a transparent lock state, which
10 improves the freedom of the transparent lock, satisfies user needs, simplifies user operations, and improves user experience.

[0022] Furthermore, the present invention could determine unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state, wherein the unlock operation information comprises third
15 operation sequence information, and perform match operations to the second input operation information which comprises fourth operation sequence information with the third operation sequence to determine whether the second input operation information satisfies the unlock operation information, and then perform a corresponding unlock operation on the screen of the touch screen device when the
20 second input operation information satisfies the unlock operation information. Furthermore, the unlock operation comprises to make the screen state information of the touch screen device in normal lock state or make the screen state information of the touch screen device in unlock state. Thereby, the present invention realizes unlocking of the touch screen device, which guarantees the integrity of the present
25 invention, satisfies user needs, simplifies user operations, and improves user experience.

[0023] Furthermore, the present invention could display a transparent lock state identification on the screen of the touch screen device when the screen state information of the touch screen device is transparent lock state, thereby prompts the
30 user current state information of the touch screen device, which satisfies user needs and improves user experience.

BRIEF DESCRIPTION OF THE DRAWINGS

35 [0024] Other features, purposes and advantages of the invention will become more explicit by means of reading the detailed statement of the non-restrictive embodiments made with reference to the accompanying drawings.

[0025] Fig. 1 shows a schematic diagram of a locking device for performing a lock operation on a screen of a touch screen device according to one aspect of the present
40 invention;

[0026] Fig. 2 shows a schematic diagram of a locking device for performing a lock operation on a screen of a touch screen device according to one preferred embodiment of the present invention;

[0027] Fig. 3 shows a flow diagram of a method for performing a lock operation on

a screen of a touch screen device according to another aspect of the present invention;
[0028] Fig. 4 shows a flow diagram of a method for performing a lock operation on a screen of a touch screen device according to one preferred embodiment of the present invention;

5 [0029] Fig. 5 shows a flow diagram of a method for performing a lock operation and unlock operation on a screen of a touch screen device according to one preferred embodiment of the present invention;

[0030] Fig. 6 shows a schematic diagram of a touch-screen device that is performing a video call in a normal state on the touch-screen device;

10 [0031] Fig. 7 shows a schematic diagram of a touch screen device that is performing a video call in a transparent lock state on the touch screen device according to one preferred embodiment of the present invention.

[0032] The same or similar reference signs in the drawings represent the same or similar component parts.

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DETAILED DESCRIPTION OF THE INVENTION

[0033] Below, details of the invention will be further provided in combination with the accompanying drawings.

20 [0034] Fig. 1 shows a schematic diagram of a locking device for performing a lock operation on a screen of a touch screen device according to one aspect of the present invention; wherein, the locking device comprises: a first obtaining module 1, a first matching module 2, a locking module 3, a displaying module 4, a lock determining module 5. Specifically, the lock determining module 5 determines lock operation
25 information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information; the first obtaining module 1 obtains first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information; the first matching module 2 performs match
30 operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information; the locking module 3 performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the
35 touch screen device are disabled; the displaying module 4 displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[0035] Here, the locking device includes, but not limited to, an electronic device that may automatically perform numerical value calculation and information processing
40 according to a preset or stored instruction, whose hardware includes, but not limited to, a micro-processor, an application-specific integrated circuit (ASIC), a field programmable gate array (FPGA), a digital signal processor (DSP), an embedded device, etc. Besides, those skilled in the art should understand that the locking device may also be a touch screen device that can realizes a lock operation on a screen,

wherein the touch screen device may use hardware in the touch screen device to perform the lock operation on the screen, or may use an operating system corresponding to the touch screen device to perform the lock operation on the screen, or may use a particular application in the touch screen device to perform the lock operation on the screen. Here, the touch screen device includes, but not limited to, for example, a smart phone with a touch screen, a PDA with a touch screen, or other device with a touch screen, etc. Those skilled in the art should understand that other locking devices are likewise suitable for the present invention, which should be included within the scope of the present invention and are incorporated here by reference.

[0036] The above modules work constantly therebetween. Here, those skilled in the art should understand that “constantly” means the above various modules perform determining lock operation information, obtaining first input operation information, matching operations to the second operation sequence information, performing a transparent lock operation, displaying information of execution results respectively in real-time or according a preset or real-time adjusted working pattern requirements, until the locking device stops obtaining first input operation information for the touch screen device.

[0037] The lock determining module 5 determines lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information.

[0038] Specifically, the lock determining module 5 obtains first operation sequence information inputted by the user through interaction with the user of the touch screen device, and determines the first operation sequence information as lock operation information for performing transparent lock to the screen of the touch screen device; or determine, through a default setting, default first operation sequence information as lock operation information for performing transparent lock to the screen of the touch screen device.

[0039] Herein, the first operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[0040] It should be noted that the above examples are only for better illustrating the technical solution of the present invention, rather than restricting the present invention. Those skilled in the art should understand, any first operation sequence information that may be used for performing transparent lock to the screen of a touch screen device should be included within the scope of the present invention.

[0041] The first obtaining module 1 obtains first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information.

[0042] Specifically, the first obtaining module 1 obtains first input operation

information inputted by the user through interaction with the user of the touch screen device, wherein the first input operation information includes second operation sequence information.

5 [0043] Here, the second operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above
10 manners.

[0044] The first matching module 2 performs match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information.

15 [0045] Specifically, the first matching module 2 performs match operations between the second operation sequence information and the first operation sequence information based on the first operation sequence information; if the first input operation information includes the lock operation information, then the second operation sequence information successfully matches the first operation sequence
20 information, i.e., the first input operation information satisfies the lock operation information, thereby performing the operation in the locking module 3; otherwise, if the first input operation information does not include the lock operation information, then the second operation sequence information fails to match the first operation sequence information, i.e., the first input operation information does not satisfy the
25 lock operation information, thereby normally performing the first operation sequence information based on the current state of the touch screen device, e.g., if the touch screen device is currently in a normal state.

[0046] The locking module 3 performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock
30 operation information, wherein physical buttons of the touch screen device are disabled.

[0047] Specifically, when the first matching module 2 determines that the first input operation information includes the lock operation information (i.e., the first input operation information satisfies the lock operation information), the locking module 3
35 performs a transparent lock operation on the screen of the touch screen device; here, the transparent lock operation forbids input operations (e.g., press, touch, click, and other operations) on the screen, and forbids physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons. Wherein the physical buttons include, but not limited to home button, power button, other physical
40 control buttons, etc.

[0048] The displaying module 4 displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[0049] Specifically, the displaying module 4 displays information of execution

results of one or more current applications as executed before the touch screen device is transparently locked on the transparently locked screen, i.e., not turning off the screen. The screen remains turning on and runs the content that is run before transparently locked.

5 [0050] For example, the touch screen device is running a video call before transparently locked. After the touch screen device is transparently locked, the displaying module 4 continues display of the video call on the screen, while the locking module 3 has forbidden inputting information to the screen and the physical buttons.

10 [0051] For example, before the touch screen device is transparently locked, it is currently running video play and picture play in the same time (e.g., each application is playing on the half of the screen). When the touch screen device is transparently locked, the displaying module 4 continues displaying, on the screen, the video play and picture play information, while the locking module 3 forbids inputting
15 information to the screen and the physical buttons.

[0052] Preferably, the displaying module further comprises an identification displaying unit (not shown). When the screen state information of the touch screen device is transparent lock state, the identification displaying unit displays a transparent lock state identification on the screen of the touch screen device.

20 [0053] Specifically, when the screen state information of the touch screen device is transparent lock state, the identification displaying unit displays, on the screen of the touch screen device, a transparent lock state identification for identifying that the touch screen device has been in the transparent lock state through a system default setting or autonomously defined by the user, such that it may prompt the user that the
25 touch screen device has been in the transparent lock state.

[0054] Here, the transparent lock state identification may be located at any location on the screen. The transparent lock state identification includes, but not limited to, various icons that may be used to indicate states.

[0055] For example, Fig. 6 shows a schematic diagram of a touch-screen device that
30 is performing a video call in a normal state on the touch-screen device. Fig. 7 shows a schematic diagram of a touch screen device that is performing a video call in a transparent lock state on the touch screen device according to one preferred embodiment of the present invention. In Fig. 7, the screen still shows the current content of the video call, the upper left corner of the touch screen device displays a
35 lock icon, which lock icon is an identification of the transparent lock state, such that the user could understand the touch screen device has been transparently locked.

[0056] Preferably, the locking device further comprises an association obtaining module (not shown) and an executing module (not shown), wherein the association obtaining module obtains one or more kinds of association input information
40 associated with a current application of the touch screen device; the executing module obtains information of execution results of the current application based on the association input information; the displaying module 4 displays the information of execution results on the transparently locked screen.

[0057] Specifically, the association obtaining module obtains, through directly

interaction with one or more kinds of association applications associated with the current application, one or more kinds of association input information associated with the current application of the touch screen device and inputted by the association application. Or, the association obtaining module obtains input information inputted
5 by the user through interaction with the user of the touch screen device, or the association obtaining module obtains one or more kinds of input information transmitted by the touch screen device through interaction with other applications or other modules of the touch screen device; after obtaining the input information, the association obtaining module selects the input information to take the one or more
10 kinds of input information associated with the current application of the touch screen device as the association input information, thereby obtaining one or more kinds of association input information associated with the current application of the touch screen device.

[0058] Herein, the associated application is an application associated with the current application, whose corresponding association input information may be used
15 to support the input or output of the current application; the association input information is the input information that may be used to support the current application.

[0059] For example, when the current application is video call, the association input information may be relevant information inputted by a microphone or a camera, so as
20 to be used to support the video call; or, for example, when the current application is a video call or watching a video or image, the association input information may be direction change information of switching the touch screen device with a gravity sensor from horizontal to longitudinal or from longitudinal to horizontal, thereby
25 switching the direction of the video or image currently watched.

[0060] Here, the launched of the association application or obtaining of the association input information may be launched based on the user's presetting, e.g.,
when a video call is not running, "input of microphone and input of camera is allowed to execute during a video call" is set in the system; or launched based a system default
30 setting, for example, it is a system default setting that other inputs than the screen and physical buttons are all applications associated with the current application; or the system setting designates two or more applications as association applications to each other, and when one application is executed in a transparent lock state, the association application associated therewith may be autonomously launched; or based on the
35 user's presetting and/or system default settings, two or more applications are set to be association applications, and meanwhile, based on a preset trigger condition, when the trigger condition is satisfied, the association application associated therewith is launched.

[0061] The executing module, based on the association input information, executes
40 the association input information in the current application, thereby obtaining execution results of the current application in conjunction with the association input information.

[0062] The displaying module 4 displays the execution results of the current application in conjunction with the association input information of the touch screen

device on the transparently locked screen. Following the above example, for example, after processing voice information inputted by the microphone and/or the pictures taken by the camera, and the like, it could play the voice information on a playing module of the current touch screen device and/or display the picture information on the current screen while transmitting the voice information and/or the picture to the communication counterpart via a corresponding transmission device.

[0063] Preferably, the locking device further comprises a detecting module (not shown). Wherein, the detecting module detects screen state information corresponding to the touch screen device; when the first input operation information satisfies the lock operation information, in conjunction with the screen state information, the locking module 3 performs a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.

[0064] Specifically, the detecting module detects at fixed time or according to a certain trigger condition, and through detecting state flagging information corresponding to the screen state information as an example, determines the screen state information corresponding to the touch screen device, wherein the trigger condition includes, but not limited to, performing the detection when the touch screen device receives input information.

[0065] Herein, the screen state information includes, but not limited to, one of a transparent lock state, a normal lock state, and a normal state. Here, different screen state information corresponds to different state flagging information.

[0066] The transparent lock state is a state of forbidding input operations (e.g., press, touch, click, and other operations) on the screen, and forbidding physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons; meanwhile, the execution results of one or more current applications of the touch screen device are still displaying on the screen. Wherein the physical buttons include, but not limited to home button, power button, other physical control buttons, etc.

[0067] The normal lock state is a state of forbidding input operations (e.g., press, touch, click, and other operations) on the screen, and unlocking the lock of physical buttons of the touch screen device, meanwhile turning off the screen, thereby realizing the objectives of locking the screen and saving power.

[0068] The normal state is a state of normally executing operations on the screen or physical buttons of the touch screen device while maintaining the screen turning on, and displaying the execution results of the operations.

[0069] When the first input operation information includes the first operation sequence information, the first input operation information satisfies the lock operation information; the locking module 3, in conjunction with the screen state information, performs a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.

[0070] For example, when the screen state information is a normal state, the locking module 3 switches the touch screen device from a normal state to a transparent lock state based on the lock operation information; when the screen state information is a normal lock state, the locking module 3 switches the normal lock state to a transparent

lock state based on the lock operation information; if the screen state information has been a transparent lock state, the touch screen device maintains the transparent lock state.

[0071] Here, the transparent lock operation forbids input operations (e.g., press, touch, click, and other operations) on the screen, and forbids physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons, wherein the physical buttons include, but not limited to home button, power button, other physical control buttons, etc.

[0072] Here, those skilled in the art should understand the lock operation information for switching the touch screen device from the normal state to the transparent lock state and the lock operation information for switching the normal lock state to the transparent lock state may be either different or identical. For example, only one kind of lock operation information may be defined so as to perform transparent lock operation on the screen of the touch screen device under any screen state information; or two kinds of lock operation information may be defined respectively to correspond to “switching from the normal state to the transparent lock state” and “switching from the normal lock state to the transparent lock state”, and it could match the first input operation information with the corresponding lock operation information, so as to realize a transparent lock operation on the screen of the touch screen device in conjunction with the screen state information.

[0073] Fig. 2 shows a schematic diagram of a locking device for performing a lock operation on a screen of a touch screen device according to one preferred embodiment of the present invention; wherein, the locking device comprises: a first obtaining module 1', a first matching module 2', a locking module 3', a displaying module 4', a second obtaining module 6', a second matching module 7', an unlocking module 8', a lock determining module 5', herein, the lock determining module 5' further comprises an unlock determining unit 51'. Specifically, the lock determining module 5' determines lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information; the first obtaining module 1' obtains first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information; the first matching module 2' performs match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information; the locking module 3' performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled; the displaying module 4' displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen; the unlock determining unit 51' determines unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state, wherein the unlock operation information comprises third operation sequence information; the second obtaining module 6' obtains second input operation information for the touch screen device, wherein the

second input operation information comprises fourth operation sequence information; the second matching module 7' performs match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock operation information; the unlocking module 8' performs a corresponding unlock operation on the screen of the touch screen device when the second input operation information satisfies the unlock operation information. Herein, the first obtaining module 1', the first matching module 2', the locking module 3', the displaying module 4' and the lock determining module 5' are identical or substantially identical to corresponding modules shown in Fig. 1, which are thus not detailed here, but incorporated here by reference.

[0074] The above modules work constantly therebetween. Here, those skilled in the art should understand that "constantly" means the above various modules perform determining lock operation information, obtaining first input operation information, matching operations to the second operation sequence information, performing a transparent lock operation, displaying information of execution results, determining unlock operation information, obtaining second input operation information, matching operations to the fourth operation sequence information, performing an unlock operation respectively in real-time or according a preset or real-time adjusted working pattern requirements, until the locking device stops obtaining first input operation information for the touch screen device.

[0075] The unlock determining unit 51' determines unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state, wherein the unlock operation information comprises third operation sequence information.

[0076] Specifically, the unlock determining unit 51' obtains third operation sequence information inputted by the user through interaction with the of user the touch screen device, and determines the third operation sequence information as unlock operation information for unlocking the screen of the touch screen device; or through a default setting, determines the default third operation sequence information as unlock operation information for unlocking the screen of the touch screen device.

[0077] Here, the third operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[0078] Here, those skilled in the art should understand that the third operation sequence may be identical to or different from the first operation sequence information for performing transparent lock.

[0079] It should be noted that the above example is only for better illustrating the technical solution of the present invention, rather than restricting the present invention. Those skilled in the art should understand, any first operation sequence information

that may be used for performing transparent lock to the screen of a touch screen device should be included within the scope of the present invention.

[0080] The second obtaining module 6' obtains second input operation information for the touch screen device, wherein the second input operation information comprises
5 fourth operation sequence information.

[0081] Specifically, the second obtaining module 6' obtains second input operation information inputted by the user through interaction with the user of the touch screen device, wherein the second input operation information comprises fourth operation sequence information.

[0082] Here, the fourth operation sequence information includes, but not limited to,
10 a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch
15 screen of the touch screen device, or a combination of one or more of the above manners.

[0083] The second matching module 7' performs match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock
20 operation information.

[0084] Specifically, the second matching module 7' performs match operations between the fourth operation sequence information and the third operation sequence information based on the third operation sequence information; if the second input operation information comprises the unlock operation information, then the fourth operation sequence information successfully matches the third operation sequence information, i.e., the second input operation information satisfies the unlock operation information, thereby performing the operation in the unlock module 8'; otherwise, if the second input operation information does not comprise the unlock operation information, then the fourth operation sequence information fails to match the third operation sequence information, i.e., the second input operation information does not satisfy the unlock operation information, thereby maintaining the transparent lock state of the touch screen device based on the current state of the touch screen device, e.g., if the touch screen device is currently in a transparent lock state.

[0085] When the second input operation information satisfies the unlock operation information, the unlock module 8' performs corresponding unlock operation on the
35 screen of the touch screen device.

[0086] Specifically, when the second matching module 7' determines that the second input operation information comprises the unlock operation information, i.e., the second input operation information satisfies the unlock operation information, then the unlock module 8' performs a corresponding unlock operation on the screen of the
40 touch screen device.

[0087] Preferably, the unlock operation includes at least one of the following:

[0088] - based on the unlock operation information, unlocking physical buttons of the touch screen device and turning off the screen of the touch screen device, such

that the screen state information of the touch screen device is normal lock state,, thereby forbidding input operations (e.g., press, touch, click, etc.) on the screen and accepting input operations on the physical buttons of the touch screen device, meanwhile turning off the screen (black screen), so as to realize the objectives of locking the screen and saving power;

[0089] - based on the unlock operation information, unlocking the physical buttons and screen of the touch screen device, such that the screen state information of the touch screen device is unlock state, thereby normally accepting input information to the screen or physical buttons of the touch screen device, and displaying the corresponding execution results on the screen.

[0090] Here, those skilled in the art should understand that the unlock operation of unlocking the touch screen device in the transparent lock state may not only be unlocking the touch screen device from the transparent lock state to the normal lock state, but also unlocking the touch screen device from the transparent lock state to the unlock state; here, the corresponding unlock operation information may be identical or different. Whether the transparent lock state is unlocked to a normal lock state or an unlock state, it may be performed based on system default settings or user customization. Further, the unlock operation information may also be used to unlock the transparent lock state to the normal lock state, and then the corresponding information for unlocking the normal lock state may be further used to unlock the touch screen device from the normal lock state to the unlock state.

[0091] Fig. 3 shows a flow diagram of a method for performing a lock operation on a screen of a touch screen device according to another aspect of the present invention. Specifically, in the step s5, the locking device determines lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information; in the step s1, the locking device obtains first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information; in the step s2, the locking device performs match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information; in the step s3, the locking device performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled; in the step s4, the locking device displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[0092] The above steps work constantly therebetween. Here, those skilled in the art should understand that “constantly” means the above various steps perform determining lock operation information, obtaining first input operation information, matching operations to the second operation sequence information, performing a transparent lock operation, displaying information of execution results respectively in real-time or according a preset or real-time adjusted working pattern requirements, until the locking device stops obtaining first input operation information for the touch

screen device.

[0093] In the step s5, the locking device determines lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information.

5 [0094] Specifically, in the step s5, the locking device obtains first operation sequence information inputted by the user through interaction with the user of the touch screen device, and determines the first operation sequence information as lock operation information for performing transparent lock to the screen of the touch screen device; or determine, through a default setting, default first operation sequence
10 information as lock operation information for performing transparent lock to the screen of the touch screen device.

[0095] Herein, the first operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and
15 other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[0096] It should be noted that the above examples are only for better illustrating the technical solution of the present invention, rather than restricting the present invention. Those skilled in the art should understand, any first operation sequence information
20 that may be used for performing transparent lock to the screen of a touch screen device should be included within the scope of the present invention.

[0097] In the step s1, the locking device obtains first input operation information for the touch screen device, wherein the first input operation information includes second
25 operation sequence information.

[0098] Specifically, in the step s1, the locking device obtains first input operation information inputted by the user through interaction with the user of the touch screen device, wherein the first input operation information includes second operation
30 sequence information.

[0099] Here, the second operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and
35 other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[00100] In the step s2, the locking device performs match operations to the second operation sequence information based on the first operation sequence information, to
40 determine whether the first input operation information includes the lock operation information.

[00101] Specifically, in the step s2, the locking device performs match operations between the second operation sequence information and the first operation sequence information based on the first operation sequence information; if the first input

operation information includes the lock operation information, then the second operation sequence information successfully matches the first operation sequence information, i.e., the first input operation information satisfies the lock operation information, thereby performing the operation in the step s3; otherwise, if the first input operation information does not include the lock operation information, then the second operation sequence information fails to match the first operation sequence information, i.e., the first input operation information does not satisfy the lock operation information, thereby normally performing the first operation sequence information based on the current state of the touch screen device, e.g., if the touch screen device is currently in a normal state.

[00102] In the step s3, the locking device performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled.

[00103] Specifically, when the step s2 determines that the first input operation information includes the lock operation information (i.e., the first input operation information satisfies the lock operation information), in the step s3, the locking device performs a transparent lock operation on the screen of the touch screen device; here, the transparent lock operation forbids input operations (e.g., press, touch, click, and other operations) on the screen, and forbids physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons. Wherein the physical buttons include, but not limited to home button, power button, other physical control buttons, etc.

[00104] In the step s4, the locking device displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen.

[00105] Specifically, in the step s4, the locking device displays information of execution results of one or more current applications as executed before the touch screen device is transparently locked on the transparently locked screen, i.e., not turning off the screen. The screen remains turning on and runs the content that is run before transparently locked.

[00106] For example, the touch screen device is running a video call before transparently locked. After the touch screen device is transparently locked, in the step s4, the locking device continues display of the video call on the screen, while in the step s3, the locking device forbids inputting information to the screen and the physical buttons.

[00107] For example, before the touch screen device is transparently locked, it is currently running video play and picture play in the same time (e.g., each application is playing on the half of the screen). When the touch screen device is transparently locked, in the step s4, the locking device continues displaying, on the screen, the video play and picture play information, while in the step s3, the locking device has forbidden inputting information to the screen and the physical buttons.

[00108] Preferably, the step s4 further comprises a step s41 (not shown). When the screen state information of the touch screen device is transparent lock state, in the step

s41, the locking device displays a transparent lock state identification on the screen of the touch screen device.

[00109] Specifically, when the screen state information of the touch screen device is transparent lock state, in the step s41, the locking device displays, on the screen of the touch screen device, a transparent lock state identification for identifying that the touch screen device has been in the transparent lock state through a system default setting or autonomously defined by the user, such that it may prompt the user that the touch screen device has been in the transparent lock state.

[00110] Here, the transparent lock state identification may be located at any location on the screen. The transparent lock state identification includes, but not limited to, various icons that may be used to indicate states.

[00111] For example, Fig. 6 shows a schematic diagram of a touch-screen device that is performing a video call in a normal state on the touch-screen device. Fig. 7 shows a schematic diagram of a touch screen device that is performing a video call in a transparent lock state on the touch screen device according to one preferred embodiment of the present invention. In Fig. 7, the screen still shows the current content of the video call, the upper left corner of the touch screen device displays a lock icon, which lock icon is an identification of the transparent lock state, such that the user could understand the touch screen device has been transparently locked.

[00112] Preferably, the method further comprises a step s9 (not shown) and a step s10 (not shown), wherein in the step s9, the locking device obtains one or more kinds of association input information associated with a current application of the touch screen device; in the step s10, the locking device obtains information of execution results of the current application based on the association input information; in the step s4, the locking device displays the information of execution results on the transparently locked screen.

[00113] Specifically, in the step s9, the locking device obtains, through directly interaction with one or more kinds of association applications associated with the current application, one or more kinds of association input information associated with the current application of the touch screen device and inputted by the association application. Or, in the step s9, the locking device obtains input information inputted by the user through interaction with the user of the touch screen device, or in the step s9, the locking device obtains one or more kinds of input information transmitted by the touch screen device through interaction with other applications or other modules of the touch screen device; after obtaining the input information, the locking device selects the input information to take the one or more kinds of input information associated with the current application of the touch screen device as the association input information, thereby obtaining one or more kinds of association input information associated with the current application of the touch screen device.

[00114] Herein, the associated application is an application associated with the current application, whose corresponding association input information may be used to support the input or output of the current application; the association input information is the input information that may be used to support the current application.

[00115] For example, when the current application is video call, the association input information may be relevant information inputted by a microphone or a camera, so as to be used to support the video call; or, for example, when the current application is a video call or watching a video or image, the association input information may be direction change information of switching the touch screen device with a gravity sensor from horizontal to longitudinal or from longitudinal to horizontal, thereby switching the direction of the video or image currently watched.

[00116] Here, the launched of the association application or obtaining of the association input information may be launched based on the user's presetting, e.g., when a video call is not running, "input of microphone and input of camera is allowed to execute during a video call" is set in the system; or launched based a system default setting, for example, it is a system default setting that other inputs than the screen and physical buttons are all applications associated with the current application; or the system setting designates two or more applications as association applications to each other, and when one application is executed in a transparent lock state, the association application associated therewith may be autonomously launched; or based on the user's presetting and/or system default settings, two or more applications are set to be association applications, and meanwhile, based on a preset trigger condition, when the trigger condition is satisfied, the association application associated therewith is launched.

[00117] In the step s10, the locking device, based on the association input information, executes the association input information in the current application, thereby obtaining execution results of the current application in conjunction with the association input information.

[00118] In the step s4, the locking device displays the execution results of the current application in conjunction with the association input information of the touch screen device on the transparently locked screen. Following the above example, for example, after processing voice information inputted by the microphone and/or the pictures taken by the camera, and the like, it could play the voice information on a playing module of the current touch screen device and/or display the picture information on the current screen while transmitting the voice information and/or the picture to the communication counterpart via a corresponding transmission device.

[00119] Preferably, the method further comprises a step s11 (not shown). Wherein, in the step s11, the locking device detects screen state information corresponding to the touch screen device; when the first input operation information satisfies the lock operation information, in conjunction with the screen state information, in the step s3, the locking device performs a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.

[00120] Specifically, in the step s11, the locking device detects at fixed time or according to a certain trigger condition, and through detecting state flagging information corresponding to the screen state information as an example, determines the screen state information corresponding to the touch screen device, wherein the trigger condition includes, but not limited to, performing the detection when the touch screen device receives input information.

[00121] Herein, the screen state information includes, but not limited to, one of a transparent lock state, a normal lock state, and a normal state. Here, different screen state information corresponds to different state flagging information.

5 [00122] The transparent lock state is a state of forbidding input operations (e.g., press, touch, click, and other operations) on the screen, and forbidding physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons; meanwhile, the execution results of one or more current applications of the touch screen device are still displaying on the screen. Wherein the physical buttons include, but not limited to home button, power button, other physical control buttons,
10 etc.

[00123] The normal lock state is a state of forbidding input operations (e.g., press, touch, click, and other operations) on the screen, and unlocking the lock of physical buttons of the touch screen device, meanwhile turning off the screen, thereby realizing the objectives of locking the screen and saving power.

15 [00124] The normal state is a state of normally executing operations on the screen or physical buttons of the touch screen device while maintaining the screen turning on, and displaying the execution results of the operations.

[00125] When the first input operation information includes the first operation sequence information, the first input operation information satisfies the lock operation information; in the step s3, the locking device, in conjunction with the screen state
20 information, performs a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.

[00126] For example, when the screen state information is a normal state, in the step s3, the locking device switches the touch screen device from a normal state to a transparent lock state based on the lock operation information; when the screen state information is a normal lock state, in the step s3, the locking device switches the normal lock state to a transparent lock state based on the lock operation information; if the screen state information has been a transparent lock state, the touch screen device maintains the transparent lock state.

25 [00127] Here, the transparent lock operation forbids input operations (e.g., press, touch, click, and other operations) on the screen, and forbids physical buttons of the touch screen device, e.g., not execute click or press operations on the physical buttons, wherein the physical buttons include, but not limited to home button, power button, other physical control buttons, etc.

30 [00128] Here, those skilled in the art should understand the lock operation information for switching the touch screen device from the normal state to the transparent lock state and the lock operation information for switching the normal lock state to the transparent lock state may be either different or identical. For example, only one kind of lock operation information may be defined so as to perform
35 transparent lock operation on the screen of the touch screen device under any screen state information; or two kinds of lock operation information may be defined respectively to correspond to “switching from the normal state to the transparent lock state” and “switching from the normal lock state to the transparent lock state”, and it
40 could match the first input operation information with the corresponding lock

operation information, so as to realize a transparent lock operation on the screen of the touch screen device in conjunction with the screen state information.

[00129] Fig. 4 shows a flow diagram of a method for performing a lock operation on a screen of a touch screen device according to one preferred embodiment of the present invention. Specifically, in the step s5', the locking device determines lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information; in the step s1', the locking device obtains first input operation information for the touch screen device, wherein the first input operation information includes second operation sequence information; in the step s2', the locking device performs match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information; in the step s3', the locking device performs a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled; in the step s4', the locking device displays information of execution results of one or more current applications of the touch screen device on the transparently locked screen; in the step s51', the locking device determines unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state, wherein the unlock operation information comprises third operation sequence information; in the step s6', the locking device obtains second input operation information for the touch screen device, wherein the second input operation information comprises fourth operation sequence information; in the step s7', the locking device performs match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock operation information; in the step s8', the locking device performs a corresponding unlock operation on the screen of the touch screen device when the second input operation information satisfies the unlock operation information. Herein, the step s1', the step s2', the step s3', the step s4' and the step s5' are identical or substantially identical to corresponding steps shown in Fig. 3, which are thus not detailed here, but incorporated here by reference.

[00130] The above steps work constantly therebetween. Here, those skilled in the art should understand that "constantly" means the above various steps perform determining lock operation information, obtaining first input operation information, matching operations to the second operation sequence information, performing a transparent lock operation, displaying information of execution results, determining unlock operation information, obtaining second input operation information, matching operations to the fourth operation sequence information, performing an unlock operation respectively in real-time or according a preset or real-time adjusted working pattern requirements, until the locking device stops obtaining first input operation information for the touch screen device.

[00131] In the step s51', the locking device determines unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state,

wherein the unlock operation information comprises third operation sequence information.

[00132] Specifically, in the step s51', the locking device obtains third operation sequence information inputted by the user through interaction with the of user the touch screen device, and determines the third operation sequence information as unlock operation information for unlocking the screen of the touch screen device; or through a default setting, determines the default third operation sequence information as unlock operation information for unlocking the screen of the touch screen device.

[00133] Here, the third operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[00134] Here, those skilled in the art should understand that the third operation sequence may be identical to or different from the first operation sequence information for performing transparent lock.

[00135] It should be noted that the above example is only for better illustrating the technical solution of the present invention, rather than restricting the present invention. Those skilled in the art should understand, any first operation sequence information that may be used for performing transparent lock to the screen of a touch screen device should be included within the scope of the present invention.

[00136] In the step s6', the locking device obtains second input operation information for the touch screen device, wherein the second input operation information comprises fourth operation sequence information.

[00137] Specifically, in the step s6', the locking device obtains second input operation information inputted by the user through interaction with the user of the touch screen device, wherein the second input operation information comprises fourth operation sequence information.

[00138] Here, the fourth operation sequence information includes, but not limited to, a touch/ press operation sequence to the screen of the touch screen device and/or physical buttons of the touch screen device (e.g., home button, power button, and other physical control buttons, etc.), for example, double-clicking onto the power button, N-clicking onto the home button, drawing a particular graph on the touch screen of the touch screen device, or a combination of one or more of the above manners.

[00139] In the step s7', the locking device performs match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock operation information.

[00140] Specifically, in the step s7', the locking device performs match operations between the fourth operation sequence information and the third operation sequence information based on the third operation sequence information; if the second input

operation information comprises the unlock operation information, then the fourth operation sequence information successfully matches the third operation sequence information, i.e., the second input operation information satisfies the unlock operation information, thereby performing the operation in the step s8'; otherwise, if the second input operation information does not comprise the unlock operation information, then the fourth operation sequence information fails to match the third operation sequence information, i.e., the second input operation information does not satisfy the unlock operation information, thereby maintaining the transparent lock state of the touch screen device based on the current state of the touch screen device, e.g., if the touch screen device is currently in a transparent lock state.

[00141] When the second input operation information satisfies the unlock operation information, in the step s8', the locking device performs corresponding unlock operation on the screen of the touch screen device.

[00142] Specifically, when in the step s7', the locking device determines that the second input operation information comprises the unlock operation information, i.e., the second input operation information satisfies the unlock operation information, then in the step s8', the locking device performs a corresponding unlock operation on the screen of the touch screen device.

[00143] Preferably, the unlock operation includes at least one of the following:

[00144] - based on the unlock operation information, unlocking physical buttons of the touch screen device and turning off the screen of the touch screen device, such that the screen state information of the touch screen device is normal lock state, thereby forbidding input operations (e.g., press, touch, click, etc.) on the screen and accepting input operations on the physical buttons of the touch screen device, meanwhile turning off the screen (black screen), so as to realize the objectives of locking the screen and saving power;

[00145] - based on the unlock operation information, unlocking the physical buttons and screen of the touch screen device, such that the screen state information of the touch screen device is unlock state, thereby normally accepting input information to the screen or physical buttons of the touch screen device, and displaying the corresponding execution results on the screen.

[00146] Here, those skilled in the art should understand that the unlock operation of unlocking the touch screen device in the transparent lock state may not only be unlocking the touch screen device from the transparent lock state to the normal lock state, but also unlocking the touch screen device from the transparent lock state to the unlock state; here, the corresponding unlock operation information may be identical or different. Whether the transparent lock state is unlocked to a normal lock state or an unlock state, it may be performed based on system default settings or user customization. Further, the unlock operation information may also be used to unlock the transparent lock state to the normal lock state, and then the corresponding information for unlocking the normal lock state may be further used to unlock the touch screen device from the normal lock state to the unlock state.

[00147] Fig. 5 shows a flow diagram of a method for performing a lock operation and unlock operation on a screen of a touch screen device according to one preferred

embodiment of the present invention.

[00148] In a normal state, the touch screen device turns on the screen and the physical buttons, and waits for a new input event, wherein the input event includes, but not limited to, any input instruction.

- 5 [00149] When the touch screen device receives any input event, the operating system of the touch screen device detects the current state of the touch screen device: whether the touch screen device is transparent locked?

- [00150] If the touch screen device is transparent locked, it is detected whether the input event belongs to an event of unlocking the transparent lock state, i.e., whether it
10 belongs to unlock operation information? If so, unlock the transparent lock and enter in the normal state; if not, ignore the input event.

- [00151] If the touch screen device is not in a transparent lock state, detect whether the input event belongs to an event of enabling transparent lock, i.e., belongs to lock operation information? If so, perform transparent lock and maintain sending of input
15 information of the current application on the screen; if not, processing the input event based on the current logic of the current state.

- [00152] To those skilled in the art, apparently the present invention is not limited to the details of the aforementioned exemplary embodiments; moreover, under the premise of not deviating from the spirit or fundamental characteristics of the invention,
20 this invention can be accomplished in other specific forms. Therefore, the embodiments should be considered exemplary and non-restrictive no matter from which point, the scope of the invention is defined by the appended claims instead of the above description, and aims at covering the meanings of the equivalent components falling into the claims and all changes within the scope in this invention.

- 25 Any reference sign in the claims shall not be deemed as limiting the concerned claims. Besides, apparently the word “comprise/include” does not exclude other components or steps, singular numbers does not exclude complex numbers, the plurality of components or means mentioned in device claims may also be accomplished by one component or means through software or hardware, the wording like first and second
30 are only used to represent names rather than any specific order.

We claim:

1. A method for performing a lock operation on a screen of a touch screen device, wherein the method comprises:
 - 5 x determining lock operation information for performing transparent lock to the screen of a touch screen device, wherein the lock operation information comprises first operation sequence information;
wherein the method further comprises:
 - a. obtaining first input operation information for the touch screen device, wherein the
 - 10 first input operation information includes second operation sequence information;
 - b. performing match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information;
 - c. performing a transparent lock operation on the screen of the touch screen device
 - 15 when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled;
 - d. displaying information of execution results of one or more current applications of the touch screen device on the transparently locked screen.
- 20 2. The method according to claim 1, wherein the method further comprises:
 - obtaining one or more kinds of association input information associated with a current application of the touch screen device;
 - obtaining information of execution results of the current application based on the association input information;
 - 25 wherein the step d comprises:
 - displaying the information of execution results on the transparently locked screen.
3. The method according to claim 1 or 2, wherein the method further comprises:
 - detecting screen state information corresponding to the touch screen device,
 - 30 wherein the step c comprises:
 - when the first input operation information satisfies the lock operation information, in conjunction with the screen state information, performing a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.
- 35 4. The method according to any one of claims 1-3, wherein the step x further comprises:
 - determining unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state, wherein the unlock operation
 - 40 information comprises third operation sequence information;
wherein the method further comprises:
 - obtaining second input operation information for the touch screen device, wherein the second input operation information comprises fourth operation sequence information;

- performing match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock operation information;

- 5 s. performing a corresponding unlock operation on the screen of the touch screen device when the second input operation information satisfies the unlock operation information.

5. The method according to claim 4, wherein the unlock operation in the step s comprises at least one of the following:

- 10 - based on the unlock operation information, unlocking physical buttons of the touch screen device and turning off the screen of the touch screen device, such that the screen state information of the touch screen device is normal lock state;
- based on the unlock operation information, unlocking the physical buttons and screen of the touch screen device, such that the screen state information of the touch
15 screen device is unlock state.

6. The method according to any one of claims 1 to 3, wherein when the screen state information of the touch screen device is transparent lock state, the step d further comprises:

- 20 - displaying a transparent lock state identification on the screen of the touch screen device.

7. A locking device for performing a lock operation on a screen of a touch screen device, wherein the locking device comprises:

- 25 lock determining module configured to determine lock operation information for performing transparent lock to a screen of a touch screen device, wherein the lock operation information comprises first operation sequence information;

wherein the locking device further comprises:

- first obtaining module configured to obtain first input operation information for the
30 touch screen device, wherein the first input operation information includes second operation sequence information;

first matching module configured to perform match operations to the second operation sequence information based on the first operation sequence information, to determine whether the first input operation information includes the lock operation information;

- 35 locking module configured to perform a transparent lock operation on the screen of the touch screen device when the first input operation information satisfies the lock operation information, wherein physical buttons of the touch screen device are disabled;

- displaying module configured to display information of execution results of one or
40 more current applications of the touch screen device on the transparently locked screen.

8. The locking device according to claim 7, wherein the device further comprises:

association obtaining module configured to obtain one or more kinds of association

input information associated with a current application of the touch screen device;
executing module configured to obtain information of execution results of the current application based on the association input information;
wherein the displaying module is configured to:

- 5 - display the information of execution results on the transparently locked screen.

9. The locking device according to claim 7 or 8, wherein the device further comprises:
detecting module configured to detect screen state information corresponding to the touch screen device,

- 10 wherein the locking module is configured to:

- when the first input operation information satisfies the lock operation information, in conjunction with the screen state information, perform a transparent lock operation on the screen of the touch screen device, wherein the physical buttons of the touch screen device are disabled.

15

10. The locking device according to any one of claims 7-9, wherein the lock determining module further comprises:

unlock determining unit configured to determine unlock operation information for unlocking the screen of the touch screen device which is in a transparent lock state,
20 wherein the unlock operation information comprises third operation sequence information;

wherein the device further comprises:

second obtaining module configured to obtain second input operation information for the touch screen device, wherein the second input operation information comprises
25 fourth operation sequence information;

second matching module configured to perform match operations to the fourth operation sequence information based on the third operation sequence information, to determine whether the second input operation information satisfies the unlock operation information;

- 30 unlocking module configured to perform a corresponding unlock operation on the screen of the touch screen device when the second input operation information satisfies the unlock operation information.

- 35 11. The locking device according to claim 10, wherein the unlock operation in the unlocking module comprises at least one of the following:

- based on the unlock operation information, unlocking physical buttons of the touch screen device and turning off the screen of the touch screen device, such that the screen state information of the touch screen device is normal lock state;

- 40 - based on the unlock operation information, unlocking the physical buttons and screen of the touch screen device, such that the screen state information of the touch screen device is unlock state.

12. The locking device according to any one of claims 7 to 9, wherein when the screen state information of the touch screen device is transparent lock state, the

displaying module further comprises:

identification displaying unit configured to display a transparent lock state identification on the screen of the touch screen device.

- 5 13. A touch screen device for performing a lock operation on a screen, wherein the device comprises a locking device according to any one of claims 7 to 12.

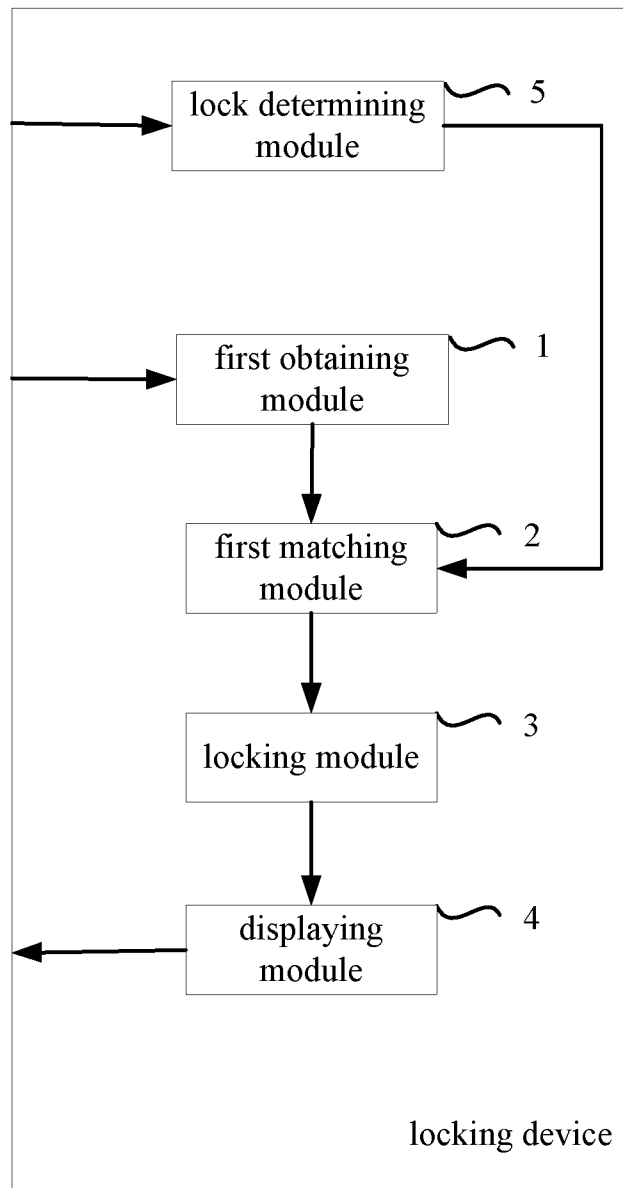


Fig. 1

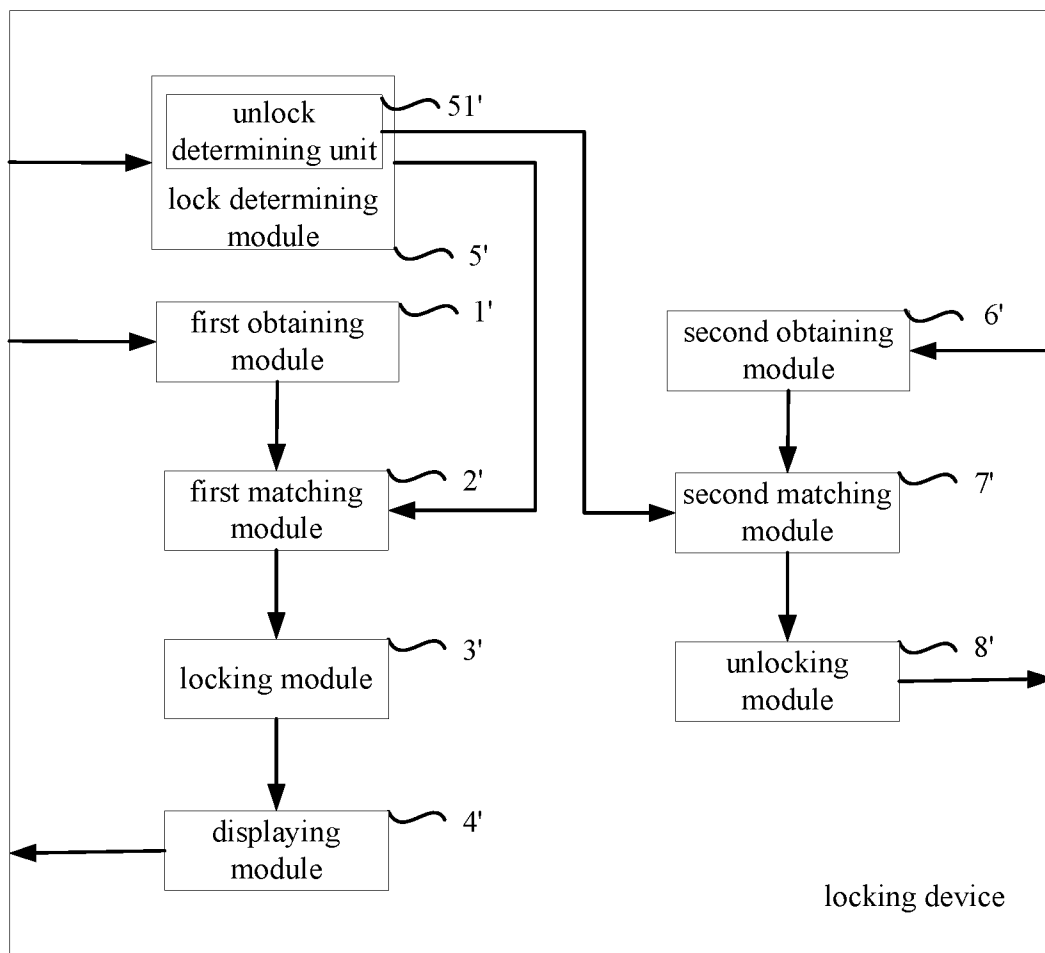


Fig. 2

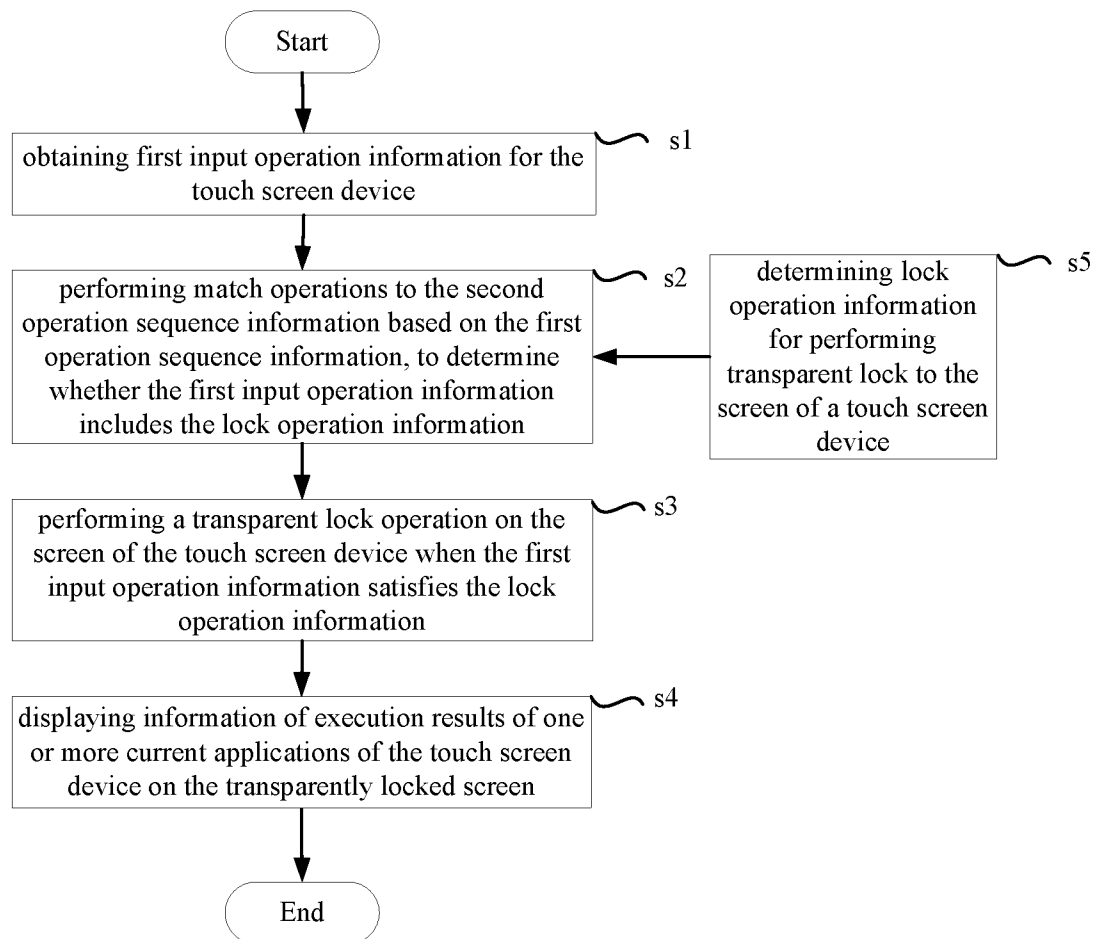


Fig. 3

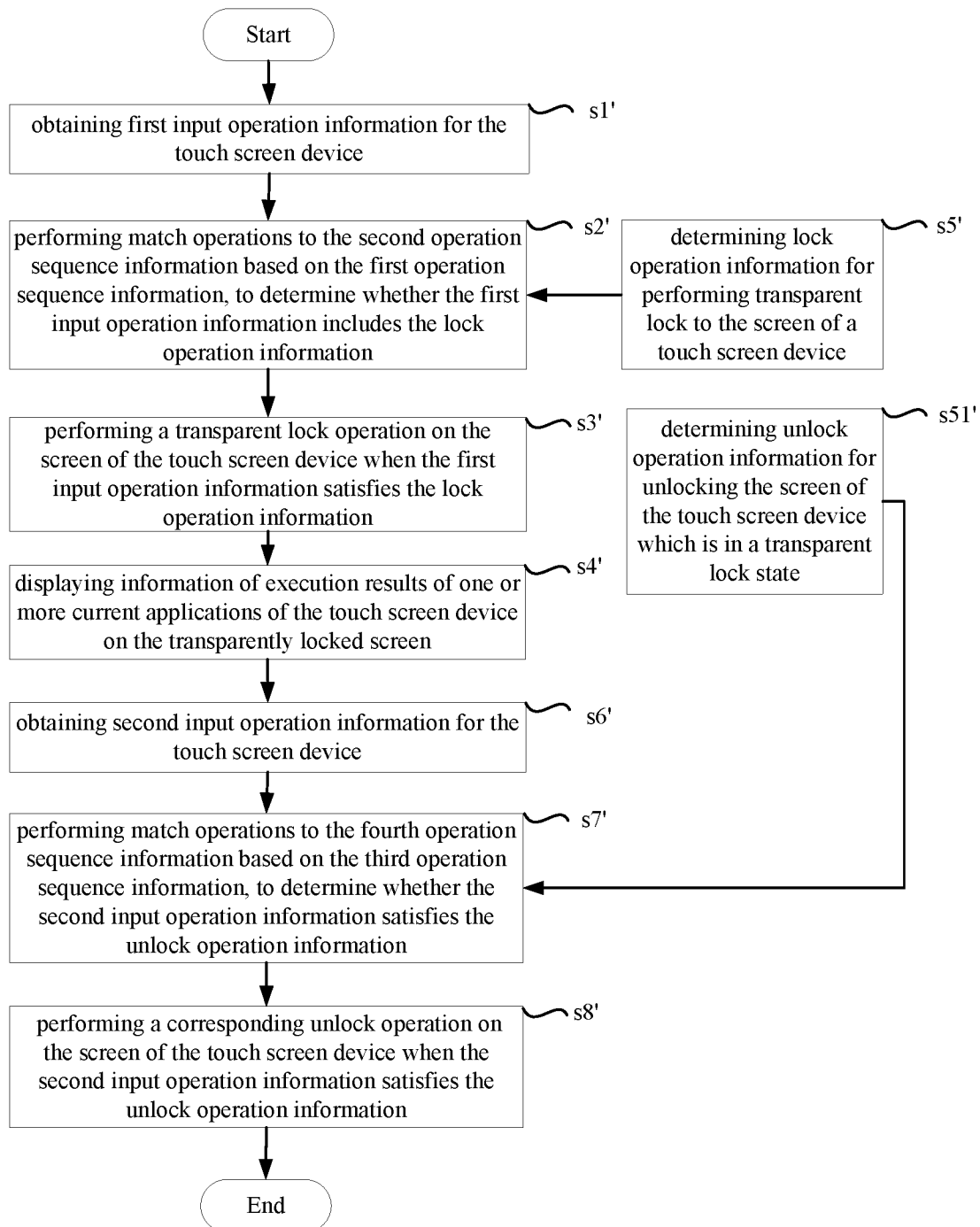


Fig. 4

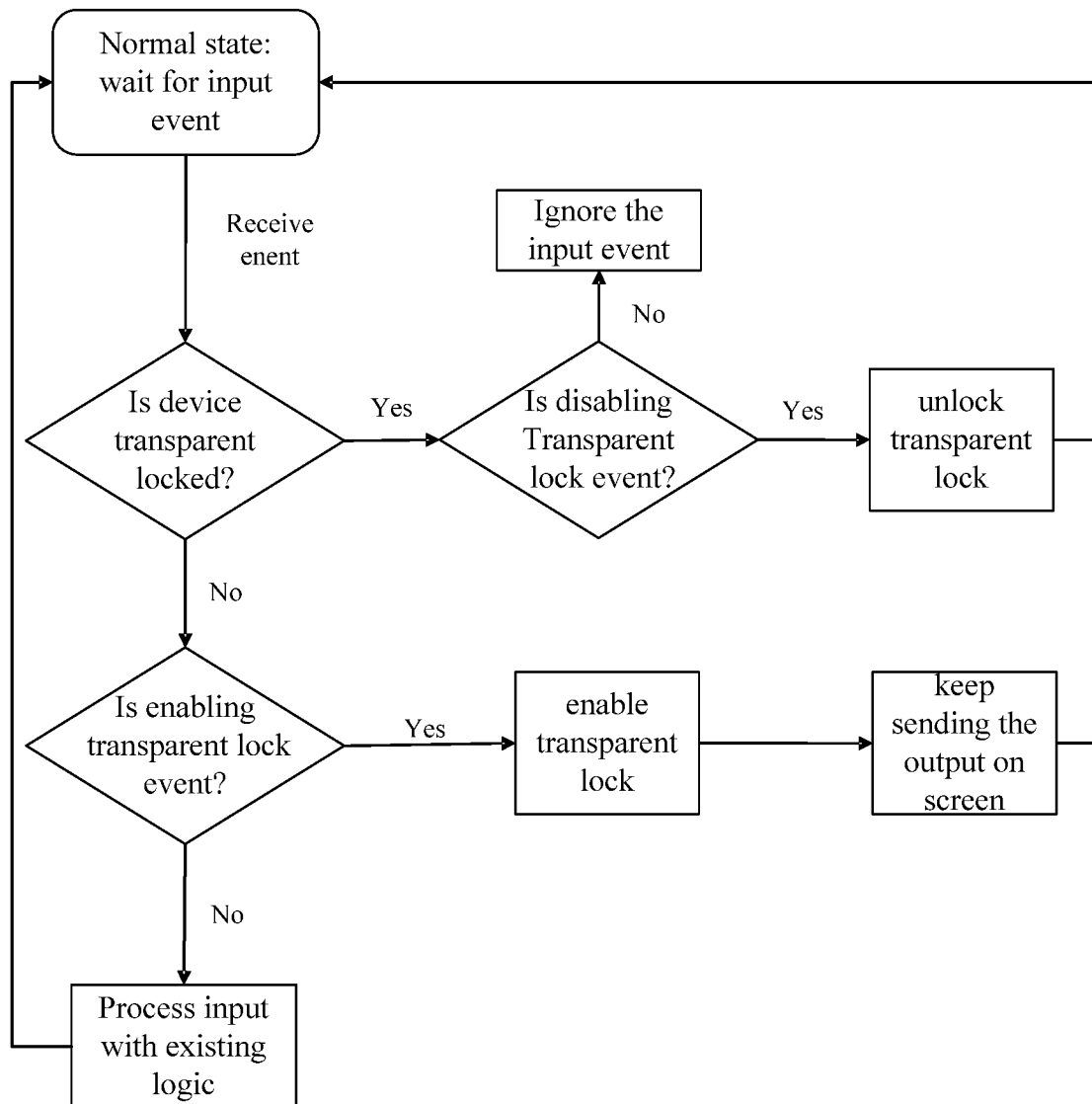


Fig. 5



Fig. 6



Fig. 7