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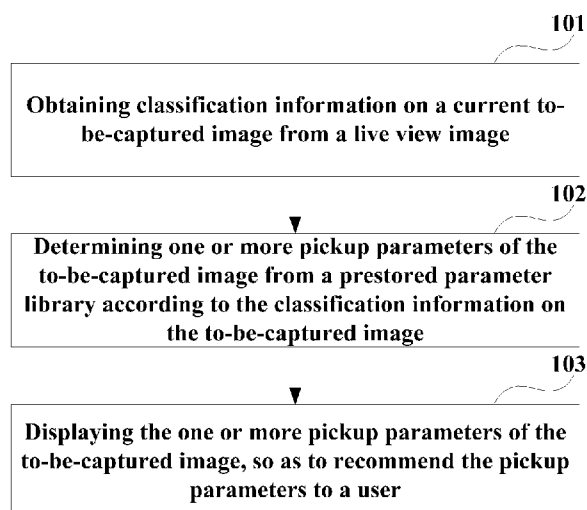


Fig. 1

(57) Abstract: A method and apparatus for determining pickup parameters and electronic equipment. The method includes: obtaining classification information on a current to-be-captured image from a live view image; determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and displaying the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user. Hence, the user is enabled to quickly obtain accurate and personalized pickup parameters, such that acquisition or determination of the pickup parameters is more intelligent, and user experiences are well improved.

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Method and Apparatus for Determining Pickup Parameters and Electronic Equipment

Technical Field

The present disclosure relates to the field of image processing technologies, and
5 in particular to a method and apparatus for determining pickup parameters and
electronic equipment.

Background

As the population of portable electronic equipment has increased (such as a
10 digital single lens reflex (DSLR) camera, a digital mirrorless camera, a smart mobile
phone, a tablet PC, and a portable digital camera, etc.), capturing an image or a video
has become easier. Electronic equipment generally has a camera, which may capture
an object in an automatic manner or manual manner.

For example, in order that an experienced user may capture a personalized image,
15 a DSLR camera or a digital mirrorless camera generally provides a manual setting
mode, allowing the user to set various pickup parameters (such as a shutter speed, and
an aperture (sometimes referred to as “aperture setting,” “aperture opening,” and so
on), etc.) by himself/herself.

For another example, for the convenience of capturing an image by an
20 unexperienced user, a smart mobile phone or a portable digital camera may provide an
automatic mode, in which various pickup parameters (such as a shutter speed, and an
aperture, etc.) may be automatically set according to capture conditions (such as an
illumination intensity) detected by one or more sensors.

However, the pickup parameters in the automatic mode are possibly less accurate
25 than in the manual mode, which will result in that an effect of a captured image is not
very good. The pickup parameters in the automatic mode may not reflect fondness,
preferences, or personality of a user, which will result in that a captured image may
not satisfy the user. In the manual mode, pickup parameters need to be set empirically,
and a process of manually setting pickup parameters may be time-consuming and
30 troublesome, which is not of interest by most users.

It should be noted that the above description of the background is merely provided for clear and complete explanation of the present disclosure and for easy understanding by those skilled in the art. It should not be understood that the above technical solution is known to those skilled in the art as it is described in the
5 background of the present disclosure.

Summary

It was found by the inventors that at present, neither the manual mode nor the automatic mode is able to make a user to quickly obtain accurate and personalized
10 pickup parameters, and it is necessary to make acquisition or determination of pickup parameters more intelligent, so as to well improve user experiences.

Embodiments of the present disclosure provide a method and apparatus for determining pickup parameters and electronic equipment. One or more pickup parameters of a to-be-captured image are determined from a prestored parameter
15 library according to classification information on the to-be-captured image, and the one or more pickup parameters of the to-be-captured image are displayed, so as to recommend the pickup parameters to a user. Hence, the user is enabled to quickly obtain accurate and personalized pickup parameters, such that acquisition or determination of the pickup parameters is more intelligent, and user experiences are
20 well improved.

According to a first aspect of the embodiments of the present disclosure, there is provided a method for determining pickup parameters, including:

- obtaining classification information on a current to-be-captured image from a live view image;
- 25 determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and
- displaying the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

30 In an embodiment, the classification information includes one or more of the

following: a capture scenario, a capture time, a capture position, a capture geotag, and a capture angle.

In an embodiment, the pickup parameters include one or more of the following: a shutter speed, focus information, a focal length, an aperture value, sensitivity, an exposure value, a white balance value, a brightness value, a saturation degree, and a contrast.

In an embodiment, the method further includes:

capturing an image based on the recommended pickup parameters.

In an embodiment, the method further includes:

capturing an image according to one or more pickup parameters set by the user, and storing the pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or

obtaining one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

In an embodiment, the method further includes:

deleting one or more pickup parameters to which the captured image corresponds in deleting the captured image, so as to update the parameter library.

In an embodiment, the method further includes:

counting one or more pickup parameters in the parameter library according to the classification information; and

determining one or more pickup parameters of the to-be-captured image according to a counting result.

In an embodiment, each item in the parameter library includes following information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image.

According to a second aspect of the embodiments of the present disclosure, there is provided an apparatus for determining pickup parameters, including:

an information acquiring unit configured to obtain classification information on a current to-be-captured image from a live view image;

a parameter determining unit configured to determine one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and

5 a parameter recommending unit configured to display the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

In an embodiment, the apparatus may further include:

an image capturing unit configured to capture an image based on the recommended pickup parameters.

10 In an embodiment, the apparatus may further include:

a parameter processing unit configured to capture an image according to one or more pickup parameters set by a user, and store the pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or

15 obtain one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

In an embodiment, the apparatus may further include:

an information counting unit configured to count one or more pickup parameters in the parameter library according to the classification information; and

20 the parameter determining unit is further configured to determine one or more pickup parameters of the to-be-captured image according to a counting result.

According to a third aspect of the embodiments of the present disclosure, there is provided electronic equipment, including a memory and a processor, the memory storing instructions executed by the processor, and the processor being configured to perform the following control by executing the instructions:

25 obtaining classification information on a current to-be-captured image from a live view image;

determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and

30 displaying the one or more pickup parameters of the to-be-captured image, so as

to recommend the pickup parameters to a user.

In an embodiment, the classification information includes one or more of the following: a capture scenario, a capture time, a capture position, a capture geotag, and a capture angle.

- 5 In an embodiment, the pickup parameters include one or more of the following: a shutter speed, focus information, a focal length, an aperture value, sensitivity, an exposure value, a white balance value, a brightness value, a saturation degree, and a contrast.

- In an embodiment, the processor is further configured to perform the following control by executing the instructions:
- 10

capturing an image based on the recommended pickup parameters.

In an embodiment, the processor is further configured to perform the following control by executing the instructions:

- capturing an image according to one or more pickup parameters set by the user, and storing the pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or
- 15

obtaining one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

- 20 In an embodiment, the processor is further configured to perform the following control by executing the instructions:

deleting one or more pickup parameters to which the captured image corresponds in deleting the captured image, so as to update the parameter library.

- In an embodiment, the processor is further configured to perform the following control by executing the instructions:
- 25

counting one or more pickup parameters in the parameter library according to the classification information; and

determining one or more pickup parameters of the to-be-captured image according to a counting result.

- 30 In an embodiment, each item in the parameter library includes following

information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image.

An advantage of the embodiments of the present disclosure exists in that pickup parameters of a to-be-captured image are determined from a prestored parameter library according to classification information on the to-be-captured image, and the one or more pickup parameters of the to-be-captured image are displayed, so as to recommend the pickup parameters to a user. Hence, the user is enabled to quickly obtain accurate and personalized pickup parameters, such that acquisition or determination of the pickup parameters is more intelligent, and user experiences are well improved.

With reference to the following description and drawings, the particular embodiments of the present disclosure are disclosed in detail, and the principles of the present disclosure and the manners of use are indicated. It should be understood that the scope of the embodiments of the present disclosure is not limited thereto. The embodiments of the present disclosure contain many alterations, modifications and equivalents within the scope of the terms of the appended claims.

Features that are described and/or illustrated with respect to one embodiment may be used in the same way or in a similar way in one or more other embodiments and/or in combination with or instead of the features of the other embodiments.

It should be emphasized that the term “comprise/include” when used in this specification is taken to specify the presence of stated features, integers, steps or components but does not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

Brief Description of the Drawings

Elements and features depicted in one drawing or embodiment of the disclosure may be combined with elements and features depicted in one or more additional drawings or embodiments. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views and may be used to designate like or similar parts in more than one embodiment.

FIG. 1 is a flowchart of the method for determining pickup parameters of an embodiment of this disclosure;

FIG. 2 is a schematic diagram of a capture scenario of an embodiment of this disclosure;

5 FIG. 3 is a schematic diagram of another capture scenario of the embodiment of this disclosure;

FIG. 4 is a schematic diagram of a further capture scenario of the embodiment of this disclosure;

10 FIG. 5 is a schematic diagram of an example of displaying recommended pickup parameters in the electronic equipment of an embodiment of this disclosure;

FIG. 6 is another flowchart of the method for determining pickup parameters of the embodiment of this disclosure;

FIG. 7 is a schematic diagram of the apparatus for determining pickup parameters of an embodiment of this disclosure; and

15 FIG. 8 is a block diagram of a systematic structure of the electronic equipment of an embodiment of this disclosure.

Detailed Description

20 These and further aspects and features of the present disclosure will be apparent with reference to the following description and attached drawings. In the description and drawings, particular embodiments of the disclosure have been disclosed in detail as being indicative of some of the ways in which the principles of the disclosure may be employed, but it is understood that the disclosure is not limited correspondingly in scope. Rather, the disclosure includes all changes, modifications and equivalents
25 coming within the terms of the appended claims.

In the embodiments of this disclosure, terms “first”, and “second”, etc., are used to differentiate different elements with respect to names, and do not indicate spatial arrangement or temporal orders of these elements, and these elements should not be limited by these terms. Terms “and/or” include any one and all combinations of one or
30 more relevantly listed terms. Terms “contain”, “include” and “have” refer to existence

of stated features, elements, components, or assemblies, but do not exclude existence or addition of one or more other features, elements, components, or assemblies.

In the embodiments of this disclosure, single forms “a”, and “the”, etc., include plural forms, and should be understood as “a kind of” or “a type of” in a broad sense, but should not defined as a meaning of “one”; and the term “the” should be understood as including both a single form and a plural form, except as specified otherwise. Furthermore, the term “according to” should be understood as “at least partially according to”, the term “based on” should be understood as “at least partially based on”, except as specified otherwise.

The interchangeable terms “electronic equipment” and “electronic device” may include portable radio communication equipment. The term “portable radio communication equipment”, which hereinafter may be referred to as a “mobile radio terminal”, “portable electronic device”, or “portable communication device”, includes all apparatuses such as mobile telephones, pagers, communicators, electronic organizers, personal digital assistants (PDAs), smart phones, media players, tablet PCs, portable communication devices, portable game devices, or the like.

In the present application, embodiments of the disclosure are described primarily in the context of a portable electronic device in the form of a mobile telephone (also referred to as “mobile phone”). However, it shall be appreciated that the disclosure is not limited to the context of a mobile telephone and may relate to any type of appropriate electronic apparatus, examples of such type of electronic apparatus including a digital single lens reflex camera, a digital mirrorless camera, a smart mobile phone, a tablet PC, a portable digital camera, a media player, a portable game device, a PDA, a computer, or the like.

Embodiments of the first aspect

An embodiment of this disclosure provides a method for determining pickup parameters, applicable to the above electronic equipment, which shall be described taking a smart mobile phone that includes a camera for capturing images (also referred to as recording images), as an example. FIG. 1 is a flowchart of the method

for determining pickup parameters of the embodiment of this disclosure. As shown in FIG. 1, the method includes:

Step 101: obtaining classification information on a current to-be-captured image from a live view image;

5 Step 102: determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and

Step 103: displaying the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

10 In an embodiment, the classification information may include one or more of the following: a capture scenario, a capture time, a capture position (also may be referred to as capture location), a capture geotag, and a capture angle. However, this disclosure is not limited thereto, and other classification information may be included.

For example, the capture scenario may include one or more of a human figure, a scene, a flower, macro-focusing (also may be referred to as macro-shot), backlight, a night scene, lamp light, etc. However, this disclosure is not limited thereto, for example, other capture scenarios may also be included.

FIG. 2 is a schematic diagram of a capture scenario of an embodiment of this disclosure. As shown in FIG. 2, the capture scenario may be “a human figure” + “backlight”. For example, in such a scenario, electronic equipment (such as a smart mobile phone) may obtain that the classification information on the current to-be-captured image is “a human figure” and “backlight” according to an image displayed on a live view screen.

FIG. 3 is a schematic diagram of another capture scenario of the embodiment of this disclosure. As shown in FIG. 3, the capture scenario may be “a scene”. For example, in such a scenario, electronic equipment (such as a smart mobile phone) may obtain that the classification information on the current to-be-captured image is “a scene” according to an image displayed on a live view screen.

FIG. 4 is a schematic diagram of a further capture scenario of the embodiment of this disclosure. As shown in FIG. 4, the capture scenario may be “a flower” + “a night

scene” + “lamp light”. For example, in such a scenario, electronic equipment (such as a smart mobile phone) may obtain that the classification information on the current to-be-captured image is “a flower” and “a night scene” and “lamp light” according to an image displayed on a live view screen.

5 In an embodiment, the classification information on the current to-be-captured image may be recognized according related existing technologies. For example, whether a current scenario is a human figure scenario may be recognized according to the face recognition technology, or whether a current scenario is a flower scenario may be recognized according to a color of an image, etc. The relevant art may be referred to for how to recognize the classification information on the current
10 to-be-captured image.

In an embodiment, the pickup parameters may include one or more of the following: a shutter speed, focus information, a focal length, an aperture value, sensitivity (such as ISO), an exposure value, a white balance value, a brightness value,
15 a saturation degree, and a contrast. However, this disclosure is not limited thereto, and other pickup parameters may be included.

In an embodiment, the parameter library may be formed and updated according to the pickup parameters of the captured image. For example, each item in the parameter library may include following information: an index or serial number of the captured
20 image, classification information on the captured image, and the pickup parameters of the captured image.

For example, Table 1 shows an example of a parameter library of electronic equipment.

Table 1

Image index	Scenario	Shutter speed	ISO	Exposure value	Contrast	Brightness	Saturation degree	...
1	Human figure	33	100	51	52	50	70	...
1	Backlight	33	100	51	52	50	70	...

3	Scene	51	50	33	65	80	20	...
4	Night scene	20	1600	35	52	30	30	...
...	...	...	...	...	...	...		...

Description is given in Table 1 taking that the classification information is a scenario as an example only. And furthermore, other classification information may also be included.

- 5 For example, Table 2 shows another example of the parameter library of the electronic equipment.

Table 2

Image serial number	Scenario	Capture time	Capture position	Shutter speed	ISO	Aperture	Exposure value	...
001001	Human figure	2016-03-21 14:02	Houston USA	33	100	2.8	51	...
001001	Backlight	2016-03-21 14:02	Houston USA	33	100	2.8	51	...
...	...	...	...	...	...	...	...	...
001103	Scene	2016-07-01 17:09	Tokyo Japan	51	50	8.0	33	...
...	...	...	...	...	...	...	...	...
004502	Night scene	2016-08-02 20:55	Tokyo Japan	20	1600	1.8	35	...
...	...			...	...	...	...	...

- 10 Tables 1 and 2 only show examples of different scenarios between the items. And furthermore, the parameter library may include data having identical scenarios. For example, Table 3 shows a further example of the parameter library of the electronic

equipment.

Table 3

Image serial number	Scenario	Capture time	Capture position	Shutter speed	ISO	Aperture	Exposure value	...
001001	Human figure	2016-03-21 14:02	Houston USA	33	100	2.8	51	...
001001	Backlight	2016-03-21 14:02	Houston USA	33	100	2.8	51	...
...	...	...	...	...	...	...	...	...
001101	Human figure	2016-05-10 15:03	Beijing China	44	50	1.8	60	...
001102	Human figure	2016-05-10 15:24	Beijing China	40	50	1.8	65	...
001103	scene	2016-07-01 17:09	Tokyo Japan	51	200	8.0	33	...
001105	Human figure	2016-07-10 17:24	Beijing China	50	400	1.8	64	...
...	...	...	...	...	...	...	...	...
004502	Night scene	2016-08-02 20:55	Tokyo Japan	20	1600	1.8	35	...
...	...	...	...	...	...	...	...	...

It should be appreciated that the examples of the parameter library are only
 5 illustrated above. However, this disclosure is not limited thereto; for example, one or more pickup parameters may be adopted, or pickup parameters not mentioned above may be included. Furthermore, the parameter library of the embodiment of this disclosure may be stored together with the captured image, and may also be stored separately from the captured image, and this disclosure is not limited thereto.

10 In an embodiment, the parameter library may be formed according to pickup parameters of a captured image captured by the user in a manual mode; however, this disclosure is not limited thereto. For example, the pickup parameters of the captured image may also be acquired from other electronic equipment, and the parameter library may be formed according to the acquired pickup parameters.

For example, the parameter library stored in the electronic equipment is as shown in Table 1. When the electronic equipment is used at a moment (such as 3:00 PM on January 1, 2017) for capturing, the camera may be started, and the classification information on the current to-be-captured image may be obtained from the live view image. For example, if the classification information is “human figure”, the electronic equipment may determine, from the parameter library according to that the classification information is “human figure”, that pickup parameters of the to-be-captured image are the pickup parameters shown in the first item in Table 1, e.g., shown in the first line or row in Table 1.

The above description is given taking one item as an example, that is, multiple pickup parameters in an item may be determined according to the classification information. However, this disclosure is not limited thereto; for example, multiple pickup parameters may be determined according to multiple items.

For example, the parameter library stored in the electronic equipment is as shown in Table 3. When the electronic equipment is used at a moment (such as 3:00 PM on January 1, 2017) for capturing, the camera may be started, and the classification information on the current to-be-captured image may be obtained from the live view image.

For example, if the classification information, which is obtained from the live view image, is both “human figure” and “backlight”, the electronic equipment may determine items having identical pickup parameter values (such as both the first item and the second item in Table 3, the pickup parameters for both of them are 33, 100, 2.8, 51, ...) in multiple items in the parameter library to which “human figure” and “backlight” correspond according to that the classification information is “human figure” and “backlight”, and takes pickup parameters of the items as the pickup parameters of the to-be-captured image.

In the embodiment of this disclosure, besides determining multiple pickup parameters at a time, individual pickup parameter may be determined separately or independently according to the classification information.

For example, the parameter library stored in the electronic equipment is as shown

in Table 3. When the electronic equipment is used at a moment (such as 3:00 PM on January 1, 2017) for capturing images, the camera may be started, and the classification information on the current to-be-captured image may be obtained from the live view image.

5 For example, if the classification information is both “human figure” and “backlight”, the electronic equipment may determine a maximum value of the number of occurrences of “aperture” (such as “1.8” in Table 3, which has appeared three times for the “human figure” and “backlight”) in the parameter library according to that the classification information is “human figure” and “backlight”, and takes 1.8 as a value
10 of “aperture” in the pickup parameters of the to-be-captured image;

and/or, the electronic equipment may determine a maximum value of the number of occurrences of “exposure value” (such as “51” in Table 3, which has appeared two times for the “human figure” and “backlight”) in the parameter library according to that the classification information is “human figure” and “backlight”, and takes 51 as
15 “an exposure value” in the pickup parameters of the to-be-captured image.

It should be appreciated that how to determine one or more recommended pickup parameters from the parameter library according to the classification information, which is described above only is illustrative or exemplary. However, this embodiment is not limited thereto, and a particular recommended policy or manner may be
20 determined according to an actual situation.

In an implementation, the pickup parameters of the to-be-captured image may be displayed on the screen of the electronic equipment, so as to recommend the pickup parameters to the user.

FIG. 5 is a schematic diagram of an example of displaying recommended pickup
25 parameters in the electronic equipment of the embodiment of this disclosure. As shown in FIG. 5, the determined pickup parameters may be recommended to the user. For example, as shown in FIG. 5, a recommended shutter speed is 33, exposure value is 51, contrast is 52, brightness is 50, sensitivity (ISO) is 800, and saturation degree is 70...

30 The user may use the recommended pickup parameters, and click “capture”

button 501 for capture. In actual use, the “capture” button may be a virtual digital key, and may also be an entity key.

It should be appreciated that FIG. 5 only illustrates a case where the pickup parameters are recommended on the screen by, for example, a smart mobile phone.

5 However, this disclosure is not limited thereto, particular pickup parameters may be selected as demanded, and a particular display manner or style may be appropriately adjusted according to particular equipment. Furthermore, the above numeral values are illustrative only, and do not mean that they shall be used in actual situations, and these numeral values may be appropriately adjusted in practical applications.

10 Hence, the pickup parameters may be recommended to the user according the prestored parameters, so as to obtain parameters favored by the user or personalized parameters, and improve satisfaction of the user. In comparison with the automatic mode, the pickup parameters recommended in this disclosure may embody fondness, preferences, or personality of the user.

15 In this disclosure, capture of an image may be performed in the manual mode. However, this disclosure is not limited thereto, and other new mode than the manual mode may also be used, such as a recommended mode, or a semi-automatic mode, etc. How to update the parameter library and how to determine the pickup parameters shall be further explained below taking a combination of the manual mode and the
20 recommended mode as an example.

FIG. 6 is another flowchart of the method for determining pickup parameters of the embodiment of this disclosure. As shown in FIG. 6, the method includes:

Step 601: starting the camera of the electronic equipment, and setting pickup parameters in the manual mode;

25 Step 602: capturing an image according to the pickup parameters set by the user;

Step 603: storing the captured image, and storing corresponding pickup parameters, so as to form and update the parameter library.

For example, the parameter library shown in Table 1 or 2 or 3 may be formed; however, this disclosure is not limited thereto.

30 Step 604: correcting data in the parameter library.

For example, the corresponding pickup parameters may be deleted in deleting a captured image, so as to update the parameter library. For example, after an image is captured, if the user is not satisfied with the image in replaying and viewing the image, the image may be deleted, and at the same time, a record of pickup parameters to which the image corresponds may be deleted from the parameter library.

In this embodiment, steps 601-604 may be executed once or for multiple times, and the parameter library may be formed and updated, so as to provide recommended pickup parameters for subsequent capture.

Step 605: starting the camera of the electronic equipment, and setting it as a recommended mode;

Step 606: obtaining classification information on a current to-be-captured image from a live view image;

Step 607: determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image.

In an implementation, the pickup parameters in the parameter library may be counted, and the pickup parameters may be determined according to a counting result.

For example, the parameter library stored in the electronic equipment is as shown in Table 3; if the classification information on the current to-be-captured image is “human figure”, in determining an aperture, an aperture value of 1.8 of a highest use rate to which the “human figure” corresponds (for example, it is used three time, as shown in Table 3) is taken as a recommended aperture value; or in determining an aperture, a mean aperture value of 2.0 to which the “human figure” corresponds (for example, the aperture values are 2.8, 1.8, 1.8, 1.8, respectively, and the mean aperture value is 2.0, as shown in Table 3) is taken as a recommended aperture value.

It should be appreciated that the counting result is illustrated above taking the use rate and mean value as examples; however, this embodiment is not limited thereto. For example, variance value, etc., may also be used. Furthermore, the above description is given taking the aperture value as an example, that is, one or more pickup parameters may be determined separately; however, this embodiment is not

limited thereto. For example, multiple pickup parameters may be determined once according to the classification information.

In another implementation, the pickup parameters may be selected randomly according to the classification information, or the pickup parameters may be determined according to multiple pieces of classification information (for example, a
5 capture scenario, a capture time, a capture position, and so on).

For example, pickup parameters to which “human figure” corresponds may be selected randomly from the parameter library, such as multiple pickup parameters to which an image of a serial number 001101 corresponds; or, pickup parameters to which a “human figure” image of a latest capture time corresponds may be selected
10 from the parameter library, such as multiple pickup parameters to which a human figure captured at 17:24 on July 10, 2016 (i.e. an image of a serial number 001105) corresponds.

As another example, pickup parameters to which a “human figure” image of a nearest capture position corresponds may be selected from the parameter library, such
15 as multiple pickup parameters to which a human figure of a capture position of Houston, USA (i.e. an image of a serial number 001101) corresponds.

Step 608: displaying the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user; and

20 Step 609: capturing an image based on the recommended pickup parameters.

In an embodiment, the recommended pickup parameters may not be modified, and may be directly used for capturing an image; and the recommended pickup parameters may be slightly tuned according to an actual situation, and then the slightly tuned pickup parameters may be used for capturing an image. Furthermore,
25 after this time of capture, the actually used pickup parameters may be stored, so as to update the parameter library.

It should be appreciated that FIG. 6 illustrates the embodiment of this disclosure only. However, this disclosure is not limited thereto. For example, an order of execution of the steps may be appropriately adjusted, and furthermore, some other
30 steps may be added, or some of these steps may be reduced. Appropriate modification

may be made by those skilled in the art, and it is not only limited to what is contained in FIG. 6.

It can be seen from the above embodiment that the pickup parameters of a to-be-captured image are determined from a prestored parameter library according to classification information on the to-be-captured image, and one or more pickup parameters of the to-be-captured image are displayed, so as to recommend the pickup parameters to a user. Hence, the user is enabled to quickly obtain accurate and personalized pickup parameters, such that acquisition or determination of the pickup parameters is more intelligent, and user experiences are well improved.

Embodiments of the second aspect

An embodiment of this disclosure provides an apparatus for determining pickup parameters, which may be, for example, electronic equipment having a function of capture, and may also be one or more components of assemblies configured in the electronic equipment. Contents in this embodiment corresponding to those in the above embodiment shall not be described herein any further.

FIG. 7 is a schematic diagram of the apparatus for determining pickup parameters of the embodiment of this disclosure. As shown in FIG. 7, the apparatus 700 for determining pickup parameters includes:

An information acquiring unit 701 configured to obtain classification information on a current to-be-captured image from a live view image.

A parameter determining unit 702 configured to determine one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and

A parameter recommending unit 703 configured to display the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

In an embodiment, the classification information includes one or more of the following: a capture scenario, a capture time, a capture position, a capture geotag, and a capture angle.

In an embodiment, the pickup parameters include one or more of the following: a shutter speed, focus information, a focal length, an aperture value, sensitivity, an exposure value, a white balance value, a brightness value, a saturation degree, and a contrast.

5 As shown in FIG. 7, the apparatus 700 for determining pickup parameters may further include:

An image capturing unit 704 configured to capture an image based on the recommended pickup parameters.

In an embodiment, the image capturing unit 704 may further be configured to
10 capture an image according to one or more pickup parameters set by the user. As shown in FIG. 7, the apparatus 700 for determining pickup parameters may further include:

A parameter processing unit 705 configured to store one or more pickup parameters to which a captured image corresponds, so as to form and update the
15 parameter library, or obtain one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

In an embodiment, the parameter processing unit 705 may further be configured to delete one or more pickup parameters to which the captured image corresponds in
20 deleting the captured image, so as to update the parameter library. For example, each item in the parameter library may include the following information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image. However, however, this disclosure is not limited thereto.

25 As shown in FIG. 7, the apparatus 700 for determining pickup parameters may further include:

An information counting unit 706 configured to count one or more pickup parameters in the parameter library according to the classification information; and the parameter determining unit 702 may further determine one or more pickup
30 parameters of the to-be-captured image according to a counting result.

It should be appreciated that the components or modules related to this disclosure are described only. However, this disclosure is not limited thereto, and the apparatus 700 for determining pickup parameters may further include other components or modules, and the relevant art may be referred to for particulars of these components or modules.

It can be seen from the above embodiment that the pickup parameters of a to-be-captured image are determined from a prestored parameter library according to classification information on the to-be-captured image, and one or more pickup parameters of the to-be-captured image are displayed, so as to recommend the pickup parameters to a user. Hence, the user is enabled to quickly obtain accurate and personalized pickup parameters, such that acquisition or determination of the pickup parameters is more intelligent, and user experiences are well improved.

Embodiments of the third aspect

The embodiment of this disclosure provides electronic equipment, which controls image forming elements (such as a camera, and a lens, etc.). The electronic equipment may be a mobile phone, digital single lens reflex camera, a digital mirrorless camera, a tablet PC, a portable digital camera, a media player, a portable game device, a PDA, a computer, or the like, and this embodiment is not limited thereto.

In an embodiment, the electronic equipment may include an image forming element, a focusing device, and the apparatus for determining pickup parameters described in the above embodiments, the contents of which being incorporated herein, with repeated parts being not going to be described herein any further.

In an embodiment, the electronic equipment may be a mobile terminal, e.g., a mobile phone, smart phone, and so on; however, this disclosure is not limited thereto.

FIG. 8 is a block diagram of a system structure of the electronic equipment of the embodiment of this disclosure. As shown in FIG. 8, the electronic equipment 800 may include a processor 801 and a memory 802, the memory 802 being coupled to the processor 801 and storing instructions executed by the processor 801. It should be noted that this figure is illustrative only, and other types of structures may also be

used, so as to supplement or replace this structure and achieve a telecommunications function or other functions.

In an implementation, the functions of the apparatus 700 for determining pickup parameters may be integrated into the processor 801. The processor 801 may be
5 configured to perform the following control by executing the instructions: obtaining classification information on a current to-be-captured image from a live view image; determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and displaying the one or more pickup parameters of the
10 to-be-captured image, so as to recommend the pickup parameters to a user.

In an implementation, the classification information may include one or more of the following: a capture scenario, a capture time, a capture position, a capture geotag, and a capture angle.

In an implementation, the pickup parameters may include one or more of the
15 following: a shutter speed, focus information, a focal length, an aperture value, sensitivity, an exposure value, a white balance value, a brightness value, a saturation degree, and a contrast.

In an implementation, the processor 801 is further configured to perform the following control by executing the instructions: capturing an image based on the
20 recommended pickup parameters.

In an implementation, the processor 801 is further configured to perform the following control by executing the instructions: capturing an image according to one or more pickup parameters set by the user, and storing pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or
25 obtaining one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

In an implementation, the processor 801 is further configured to perform the following control by executing the instructions: deleting one or more pickup parameters to which the captured image corresponds in deleting the captured image,
30 so as to update the parameter library.

In an implementation, the processor 801 is further configured to perform the following control by executing the instructions: counting one or more pickup parameters in the parameter library according to the classification information; and determining one or more pickup parameters of the to-be-captured image according to
5 a counting result.

In an implementation, each item in the parameter library may include following information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image.

In another implementation, the apparatus 700 for determining pickup parameters
10 and the processor 801 may be configured separately. For example, the apparatus 700 for determining pickup parameters may be configured as a chip, e.g., one or more integrated circuit chips or the like, connected to the processor 801, with its functions being realized under control of the processor 801.

As shown in FIG. 8, the electronic equipment 800 may further include a
15 communication module 803, an input unit 804, a camera 805, a display 806 and a power supply 807.

As shown in FIG. 8, the processor 801 (sometimes referred to as a controller or control, which may include a microprocessor or other processor devices and/or logic devices) receives input and controls operations of every component of the electronic
20 equipment 800. The input unit 804 is, for example, a button or a touch input device. The camera 805 is configured to capture image data, and to provide the captured image data to the processor 801 for use in a conventional manner, such as storage, and transmission, etc.

The power supply 807 is configured to supply power to the electronic equipment
25 800. The display 806 is configured to display objects to be displayed, such as images, and words, etc. The display may be, for example, an LCD display or an LED display; however, it is not limited thereto and may be another display of a type that currently exists or comes into existence in the future.

The memory 802 may be a solid memory, such as a read-only memory (ROM), a
30 random-access memory (RAM), and a SIM card, etc. It may also be such a memory

that may store information when power is off, may be selectively erased, and may be provided with more data, and an example of such a memory is sometimes referred to as an EPROM, etc. The memory 802 may also be another type of device. The memory 802 may include a buffer memory (sometimes referred to as a buffer). The memory 5 802 may include an application/function storage portion configured to store applications and function programs or procedures executing operations of the electronic equipment 800 via the processor 801. The memory may include a non-transitive memory or memory portion for storing instructions and so on, e.g., including the computer readable program mentioned below, for example.

10 The memory 802 may further include a data storage portion configured to store data, such as a contact, digital data, a picture, a voice and/or any other data used by the electronic equipment 800. A driver storage portion of the memory 802 includes various drivers of the electronic equipment 800 for communication functions and/or for executing other functions (such as message transmission application, and directory 15 application, etc.) of the electronic equipment 800.

The communication module 803 is a transmitter/receiver transmitting and receiving signals via antennas. The communication module (transmitter/receiver) 803 is coupled to the processor 801 to provide input signals and receive output signals, which may be identical to a case in a conventional communication terminal. Based on 20 different communication technologies, in the same electronic equipment, multiple communication modules 803, such as a cellular network module, a Bluetooth module and/or a WLAN module, etc., may be provided, so as to achieve general telecommunications functions.

It should be appreciated that FIG. 8 only illustrates a part of the structure of the 25 electronic equipment 800. The electronic equipment 800 does not necessarily include all the components shown In FIG. 8. Furthermore, the electronic equipment 800 may include one or more components not shown in FIG. 8, and the relevant art may be referred to.

An embodiment of the present disclosure provides a computer readable program 30 code, which, when executed in electronic equipment, will cause the electronic

equipment to carry out the method for determining pickup parameters as described in Embodiment 1.

An embodiment of the present disclosure provides a computer readable medium, including a computer readable program code, which will cause electronic equipment
5 unit to carry out the method for determining pickup parameters as described in Embodiment 1.

The preferred embodiments of the present disclosure are described above with reference to the drawings. The many features and advantages of the embodiments are apparent from the detailed specification and, thus, it is intended by the appended
10 claims to cover all such features and advantages of the embodiments that fall within the scope thereof. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the inventive embodiments to the exact construction and operation illustrated and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope
15 thereof.

It should be understood that each of the parts of the present disclosure may be implemented by hardware, software, firmware, or a combination thereof. In the above embodiments, multiple steps or methods may be realized by software or firmware that is stored in the memory and executed by an appropriate instruction executing system.
20 For example, if it is realized by hardware, it may be realized by any one of the following technologies known in the art or a combination thereof as in another embodiment: a discrete logic circuit having a logic gate circuit for realizing logic functions of data signals, application-specific integrated circuit having an appropriate combined logic gate circuit, a programmable gate array (PGA), and a field
25 programmable gate array (FPGA), etc.

The description or blocks in the flowcharts or of any process or method in other manners may be understood as being indicative of including one or more modules, segments or parts for realizing the codes of executable instructions of the steps in specific logic functions or processes, and that the scope of the preferred embodiments
30 of the present disclosure include other implementations, wherein the functions may be

executed in manners different from those shown or discussed, including executing the functions according to the related functions in a substantially simultaneous manner or in a reverse order, which should be understood by those skilled in the art to which the present disclosure pertains.

5 The logic and/or steps shown in the flowcharts or described in other manners here may be, for example, understood as a sequencing list of executable instructions for realizing logic functions, which may be implemented in any computer readable medium, for use by an instruction executing system, device or apparatus (such as a system including a computer, a system including a processor, or other systems capable
10 of extracting instructions from an instruction executing system, device or apparatus and executing the instructions), or for use in combination with the instruction executing system, device or apparatus.

 The above literal description and drawings show various features of the present disclosure. It should be understood that a person of ordinary skill in the art may
15 prepare suitable computer codes to carry out each of the steps and processes described above and illustrated in the drawings. It should also be understood that the above-described terminals, computers, servers, and networks, etc. may be any type, and the computer codes may be prepared according to the disclosure contained herein to carry out the present disclosure by using the devices.

20 Particular embodiments of the present disclosure have been disclosed herein. Those skilled in the art will readily recognize that the present disclosure is applicable in other environments. In practice, there exist many embodiments and implementations. The appended claims are by no means intended to limit the scope of the present disclosure to the above particular embodiments. Furthermore, any
25 reference to “a device to...” is an explanation of device plus function for describing elements and claims, and it is not desired that any element using no reference to “a device to...” is understood as an element of device plus function, even though the wording of “device” is included in that claim.

 Although a particular preferred embodiment or embodiments have been shown
30 and the present disclosure has been described, it is obvious that equivalent

modifications and variants are conceivable to those skilled in the art in reading and understanding the description and drawings. Especially for various functions executed by the above elements (portions, assemblies, apparatus, and compositions, etc.), except otherwise specified, it is desirable that the terms (including the reference to

5 “device”) describing these elements correspond to any element executing particular functions of these elements (i.e. functional equivalents), even though the element is different from that executing the function of an exemplary embodiment or embodiments illustrated in the present disclosure with respect to structure. Furthermore, although the particular feature of the present disclosure is described with

10 respect to only one or more of the illustrated embodiments, such a feature may be combined with one or more other features of other embodiments as desired and in consideration of advantageous aspects of any given or particular application.

CLAIMS

1. A method for determining pickup parameters, comprising:

obtaining classification information on a current to-be-captured image from a live

5 view image;

determining one or more pickup parameters of the to-be-captured image from a
prestored parameter library according to the classification information on the
to-be-captured image; and

10 displaying the one or more pickup parameters of the to-be-captured image, so as
to recommend the pickup parameters to a user.

2. The method according to claim 1, wherein the classification information
comprises one or more of the following: a capture scenario, a capture time, a capture
position, a capture geotag, and a capture angle.

3. The method according to either one of claims 1 or 2, wherein the pickup
15 parameters comprise one or more of the following: a shutter speed, focus information,
a focal length, an aperture value, sensitivity, an exposure value, a white balance value,
a brightness value, a saturation degree, and a contrast.

4. The method according to any one of claims 1-3, wherein the method further
comprises:

20 capturing an image based on the recommended pickup parameters.

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

capturing an image according to one or more pickup parameters set by a user, and
storing the pickup parameters to which a captured image corresponds, so as to form
25 and update the parameter library; or

obtaining one or more pickup parameters to which the captured image
corresponds from other electronic equipment, so as to form and update the parameter
library.

6. The method according to any one of claims 1-5, wherein the method further
30 comprises:

deleting one or more pickup parameters to which the captured image corresponds in deleting the captured image, so as to update the parameter library.

7. The method according to any one of claims 1-6, wherein the method further comprises:

5 counting one or more pickup parameters in the parameter library according to the classification information; and

 determining one or more pickup parameters of the to-be-captured image according to a counting result.

8. The method according to any one of claims 1-7, wherein each item in the
10 parameter library comprises following information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image.

9. An apparatus for determining pickup parameters, comprising:

 an information acquiring unit configured to obtain classification information on a
15 current to-be-captured image from a live view image;

 a parameter determining unit configured to determine one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the to-be-captured image; and

 a parameter recommending unit configured to display the one or more pickup
20 parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

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

 an image capturing unit configured to capture an image based on the recommended pickup parameters.

25 11. The apparatus according to either one of claims 9 or 10, wherein the apparatus further comprises:

 a parameter processing unit configured to capture an image according to one or more pickup parameters set by a user, and store the pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or

30 obtain one or more pickup parameters to which the captured image corresponds

from other electronic equipment, so as to form and update the parameter library.

12. The apparatus according to any one of claims 9-11, wherein the apparatus further comprises:

an information counting unit configured to count one or more pickup parameters
5 in the parameter library according to the classification information; and

the parameter determining unit is further configured to determine one or more pickup parameters of the to-be-captured image according to a counting result.

13. Electronic equipment, comprising a memory and a processor, the memory storing instructions executed by the processor, and the processor being configured to
10 perform the following control by executing the instructions:

obtaining classification information on a current to-be-captured image from a live view image;

determining one or more pickup parameters of the to-be-captured image from a prestored parameter library according to the classification information on the
15 to-be-captured image; and

displaying the one or more pickup parameters of the to-be-captured image, so as to recommend the pickup parameters to a user.

14. The electronic equipment according to claim 13, wherein the classification information comprises one or more of the following: a capture scenario, a capture
20 time, a capture position, a capture geotag, and a capture angle.

15. The electronic equipment according to either one of claims 13 or 14, wherein the pickup parameters comprise one or more of the following: a shutter speed, focus information, a focal length, an aperture value, sensitivity, an exposure value, a white balance value, a brightness value, a saturation degree, and a contrast.

25 16. The electronic equipment according to any one of claims 13-15, wherein the processor is further configured to perform the following control by executing the instructions:

capturing an image based on the recommended pickup parameters.

17. The electronic equipment according to any one of claims 13-16, wherein the
30 processor is further configured to perform the following control by executing the

instructions:

capturing an image according to one or more pickup parameters set by a user, and storing the pickup parameters to which a captured image corresponds, so as to form and update the parameter library; or

- 5 obtaining one or more pickup parameters to which the captured image corresponds from other electronic equipment, so as to form and update the parameter library.

18. The electronic equipment according to any one of claims 13-17, wherein the processor is further configured to perform the following control by executing the
10 instructions:

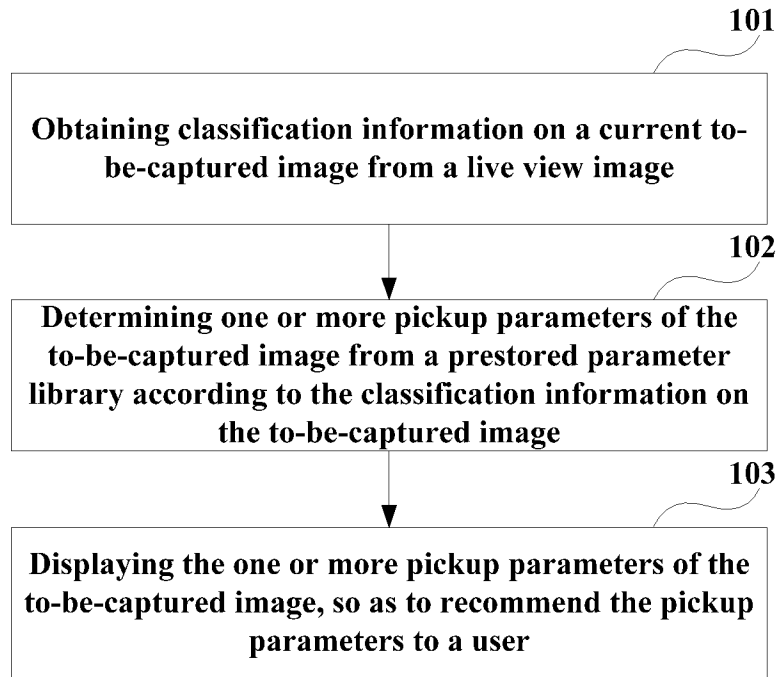
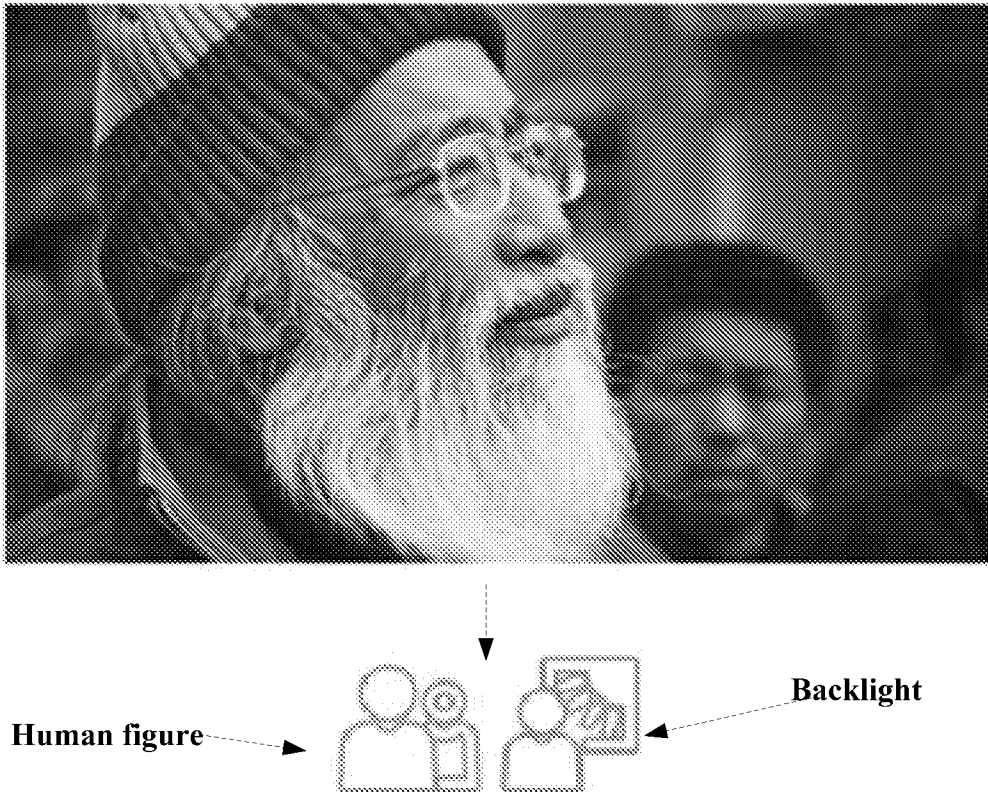
deleting one or more pickup parameters to which the captured image corresponds in deleting the captured image, so as to update the parameter library.

19. The electronic equipment according to any one of claims 13-18, wherein the processor is further configured to perform the following control by executing the
15 instructions:

counting one or more pickup parameters in the parameter library according to the classification information; and

determining one or more pickup parameters of the to-be-captured image according to a counting result.

- 20 20. The electronic equipment according to any one of claims 13-19, wherein each item in the parameter library comprises following information: an index or serial number of the captured image, classification information on the captured image, and the pickup parameters of the captured image.

**Fig. 1****Fig. 2**

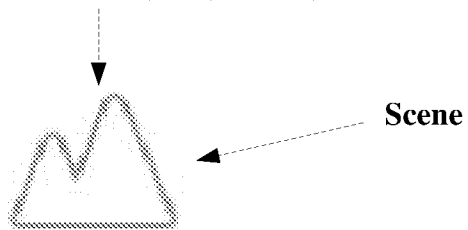


Fig. 3

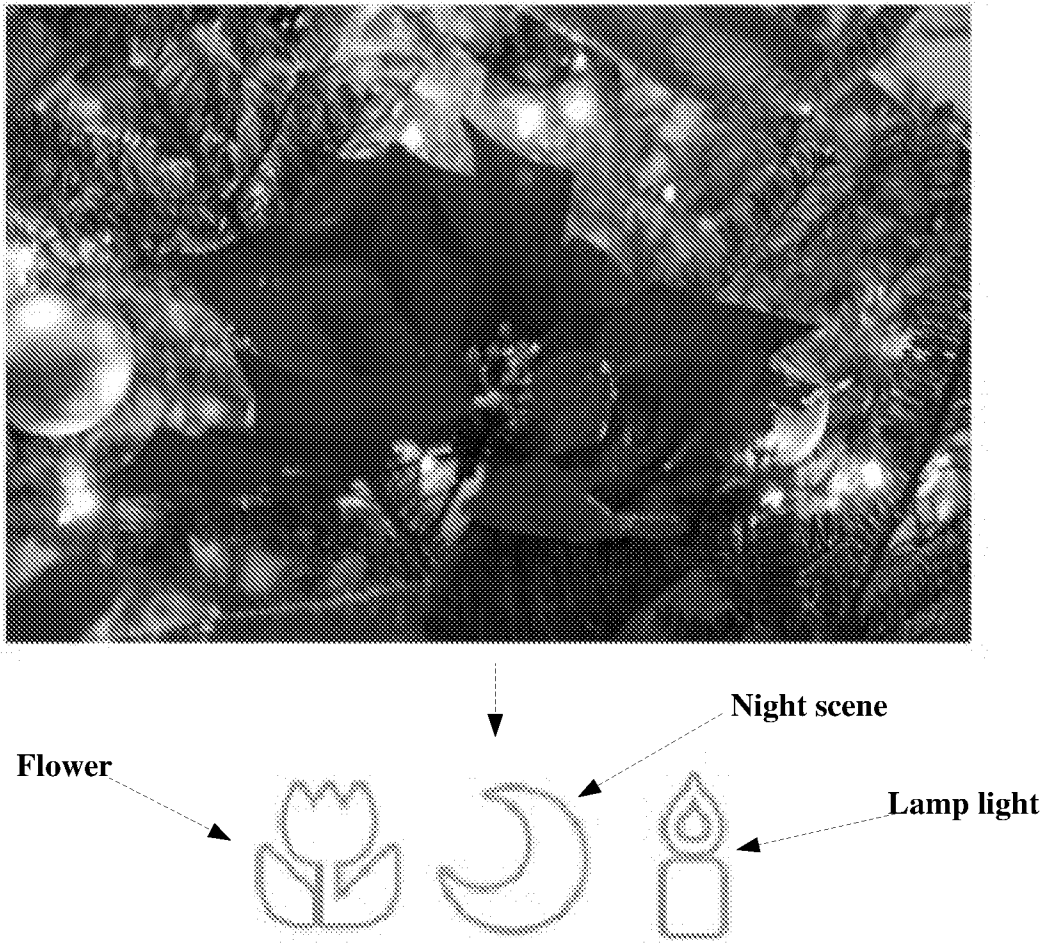


Fig. 4

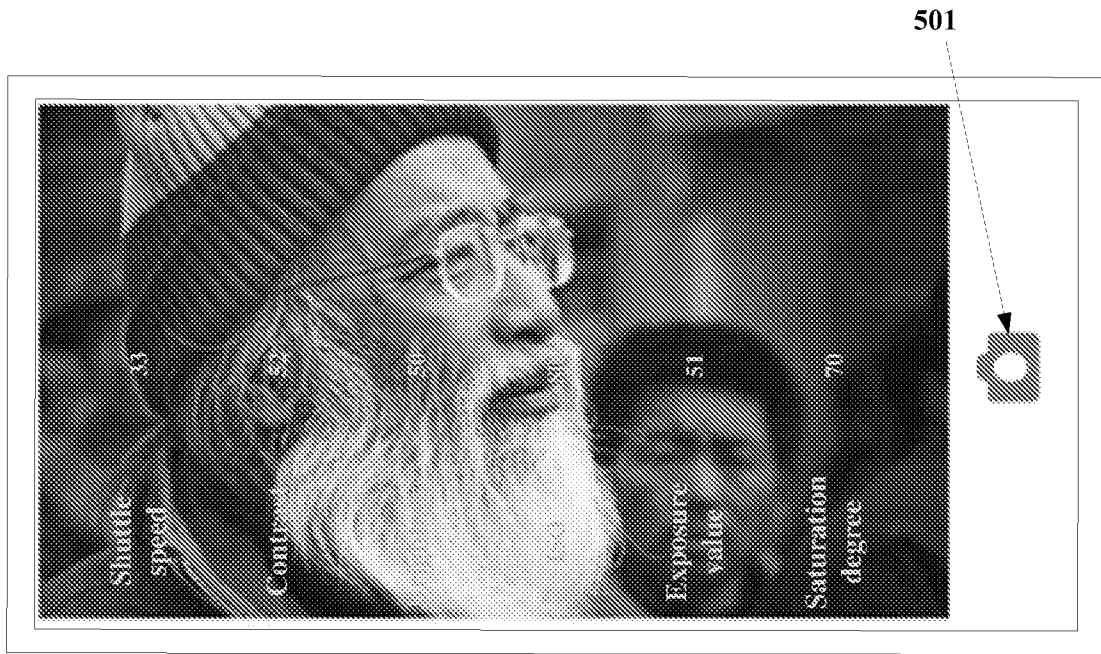
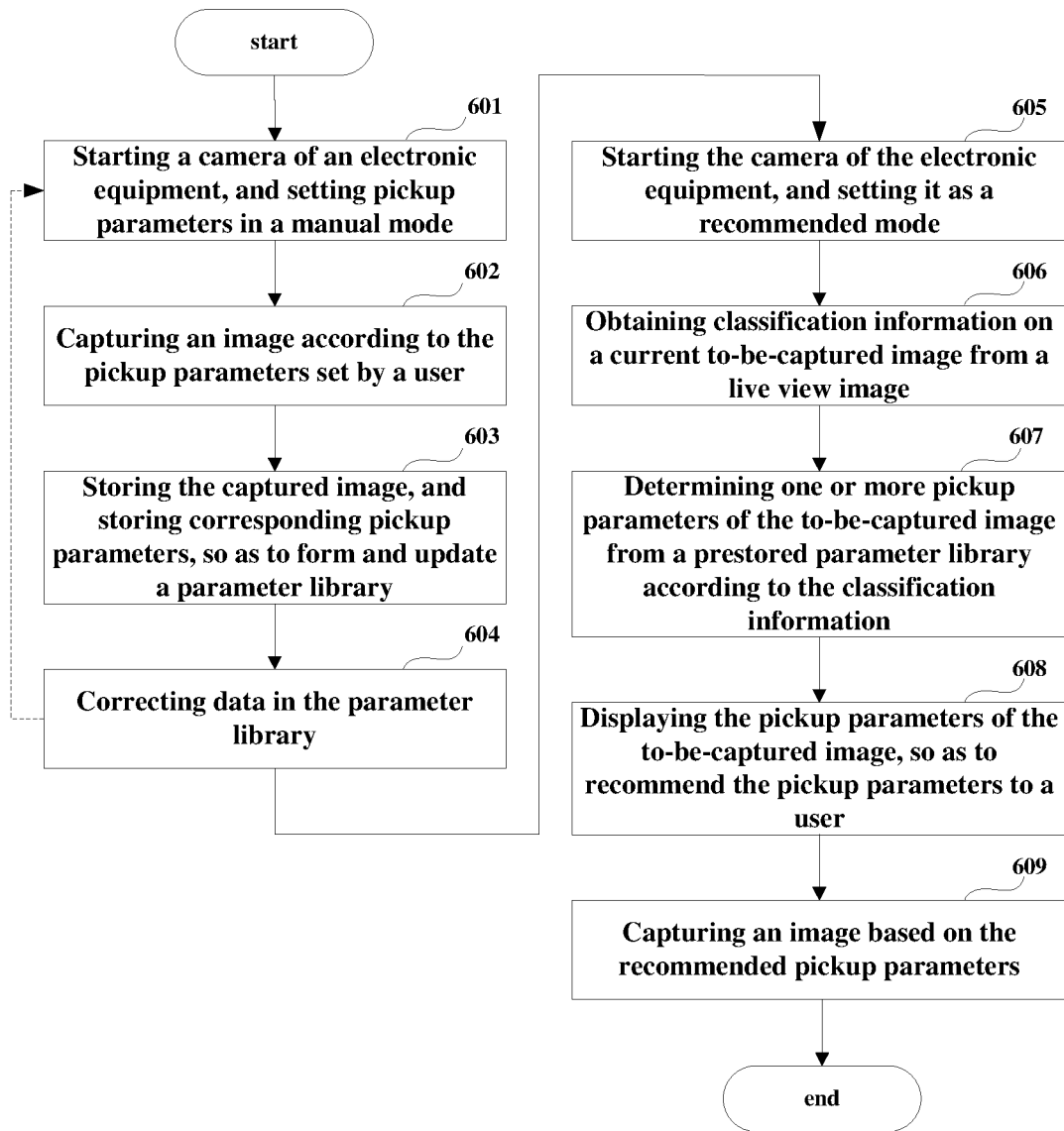
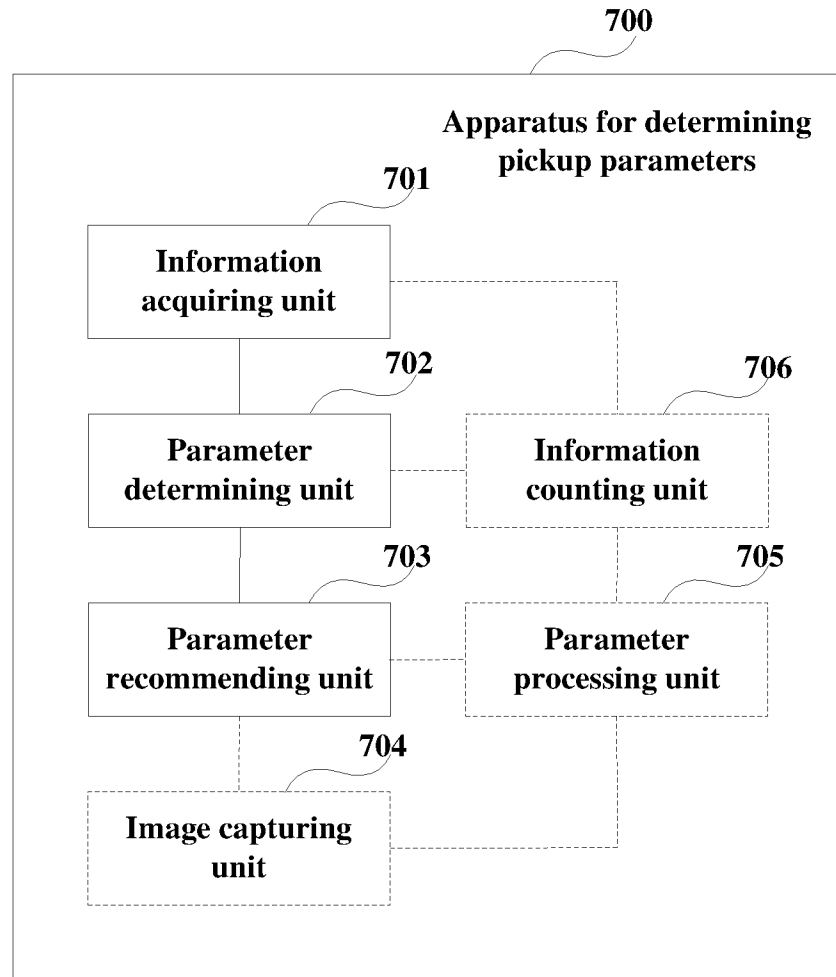
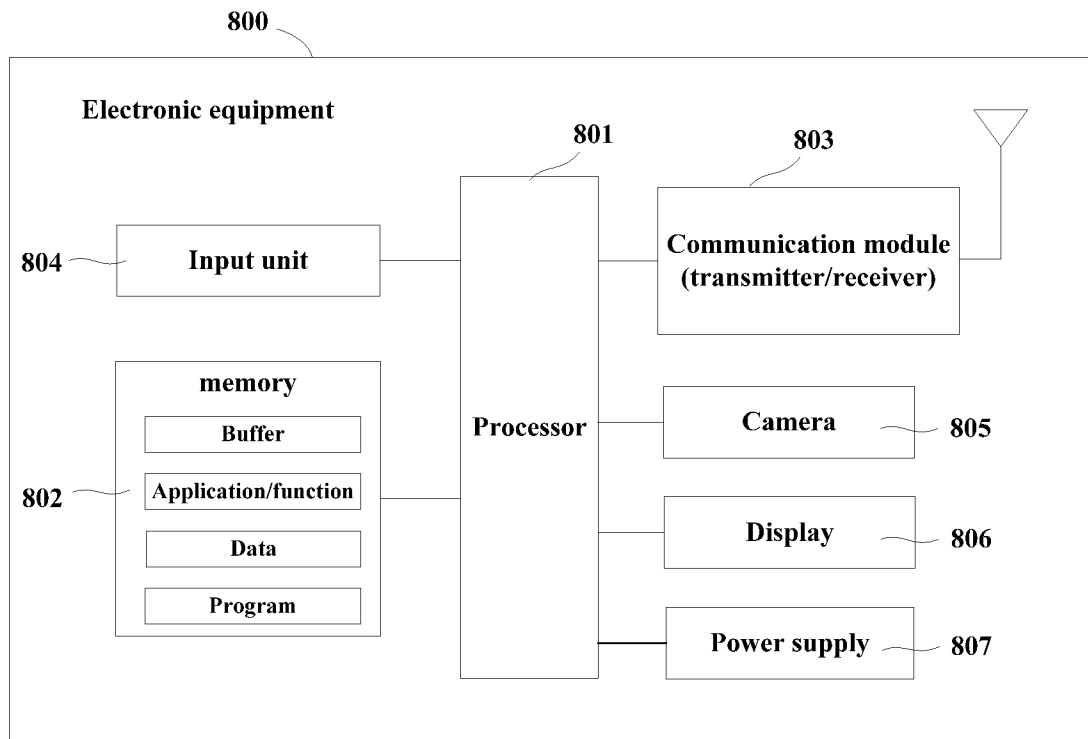


Fig. 5

**Fig. 6**

**Fig. 7**

**Fig. 8**

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2017/077470

A. CLASSIFICATION OF SUBJECT MATTER

H04N 5/232(2006.01)i

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)

H04N, G06F, G06K

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)

CNPAT,CNKI,WPI,EPDOC:class+, image, captur+, pickup, parameter, recommend, accurate, person+, intelligen+, experience, camera, photo, shoot+, tak+, type

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 101193206 A (ALTEK CORPORATION) 04 June 2008 (2008-06-04) description, page 1, paragraph [0004] to page 5, paragraph [0005]	1-20
X	CN 102591868 A (RICOH CO., LTD.) 18 July 2012 (2012-07-18) description, paragraphs [0002]-[0006], paragraphs [0025]-[0063], figures 1-5	1-20
X	CN 104885442 A (OLYMPUS CORPORATION) 02 September 2015 (2015-09-02) description, paragraphs [0002]-[0008], paragraphs [0027]-[0214], figures 1-3, 10	1-20
A	CN 104767941 A (NUBIA TECHNOLOGY CO., LTD.) 08 July 2015 (2015-07-08) the whole document	1-20
A	CN 106165391 A (GOOGLE TECHNOLOGY HOLDINGS LLC.) 23 November 2016 (2016-11-23) the whole document	1-20
A	WO 2011058675 A1 (PANASONIC CORPORATION) 19 May 2011 (2011-05-19) the whole document	1-20
A	US 2006164536 A1 (CASIO COMPUTER CO., LTD.) 27 July 2006 (2006-07-27) the whole document	1-20

☐ 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

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“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 2017

Date of mailing of the international search report

28 December 2017

Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2017/077470

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				JP	4395619	B2	13 January 2010
				US	7800677	B2	21 September 2010