The present invention relates to a zoom camera with an automatic power-shutoff function, that includes a motor including a zoom motor, a focal-distance-recognizing unit for outputting a signal corresponding to a focal distance, and a controller for positioning a body tube in a wide-angle position in the case when the camera has not operated during a first stop-time period and shuts off power if the camera has not operated during a second stop-time period, wherein it becomes possible to protect the body tube from an external impact by positioning the body tube in the wide-angle position during the first stop-time period and to take a photograph instantly when he sees a subject by eliminating the time required for turning the power on again.
START

POWER SWITCH "ON" - S200

FIRST STOP-TIME PERIOD? NO - S210
YES - S230

WIDE-ANGLE POSITION? NO - S220
YES - MOVE TO WIDE WIDE-ANGLE POSITION

SECOND STOP-TIME PERIOD? NO - S240
YES - SHUTOFF POWER - S250

END
ZOOM CAMERA WITH AUTOMATIC POWER-SHUTOFF FUNCTION AND THE AUTOMATIC POWER-SHUTOFF METHOD THEREOF

BACKGROUND OF THE INVENTION

[0001] (a) Field of the Invention

[0002] The present invention relates to a zoom camera, and more particularly to a zoom camera with an automatic power-shutoff function and the automatic power-shutoff method thereof.

[0003] (b) Description of the Related Art

[0004] In a general zoom camera, power is shut off after a lens cap is closed and a body tube is retracted into the camera, and when all switches of the camera do not operate during a predetermined time period, in order to prevent damage to the body tube by external impact when the body tube is extended to a telephoto position.

[0005] Accordingly, it is impossible to instantly take a photograph when a user sees a subject, since the user must operate a power switch to prepare the camera to a ready state and select a desired photographing mode.

[0006] Therefore, in such a related art zoom camera, there are problems that in the body tube may be damaged by an external impact caused within a predetermined time period, and it is impossible to take a quick photograph of a momentarily-seen subject since the lens cap is closed and the body tube is retracted into the camera, and it is automatically turned off after the predetermined time period has elapsed.

SUMMARY OF THE INVENTION

[0007] Therefore, the present invention is derived to resolve the above disadvantages and problems of the related art and has an object to provide a zoom camera with an automatic power-shutoff function and the automatic power-shutoff method thereof, in which it is possible to protect a body tube within a predetermined time period and take a photograph of a subject instantly.

[0008] According to the present invention, if the zoom camera has not operated until a first stop-time period has elapsed, a body tube comes into a wide-angle state. Thereafter, if the zoom camera has not operated until a second stop-time period has elapsed, a lens cap is closed and the body tube is put in a closed position for shutting off power.

[0009] According to one aspect of the present invention, the zoom camera with an automatic power-shutoff function as above includes a power supply, a body tube-moving unit, a body tube position detector, a controller, and a switch.

[0010] The power supply supplies power required for operating the camera, the body tube-moving unit drives a body tube to move, and the body tube position detector detects a position of the body tube.

[0011] The controller analyzes a signal output from the body tube position detector and moves the body tube toward a wide-angle position by operating the body tube-moving unit, if the body tube is not in the wide-angle position and all switches of the camera have not operated during the first stop-time period after a previous operation of the camera. Further, the controller puts the body tube in a closed position by operating the body tube-moving unit again and shuts off the power in the case all switches of the camera have not operated during the second stop-time period after the first stop-time period.

[0012] The switch includes a power switch for turning the power supply on and off.

[0013] At this time, the controller maintains a current photographing mode and a photographing preparation state before the second stop-time period elapses, and operates the body tube again for closing the lens cap and putting the body tube in the closed position if the camera does not operate during the second stop-time period.

[0014] According to another aspect of the present invention, a method for automatically shutting off power of a zoom camera with an automatic power-shutoff function includes a first step of supplying power from a power supply by turning on a power switch; a second step of determining whether all switches of the camera have not operated during a first stop-time period; a third step of determining whether a current position of the body tube is in a wide-angle position through the body tube position detector; a fourth step of positioning the body tube in the wide-angle position by driving a zoom motor of the body tube-moving unit if the controller determines that the first stop-time period has elapsed without any operations of the camera; a fifth step of determining whether all switches of the camera have not operated during a second stop-time period if the controller determines that the body tube is not in the wide-angle position; and a sixth step of putting the body tube in a closed position, and thereafter shutting off the power if the controller determines that the camera has not operated during the second stop-time period, wherein if any operation of the camera is sensed by the controller in the second stop-time period, it is checked again whether the first stop-time period has elapsed or not.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] A more complete appreciation of the invention, and many of the attendant advantages thereof, will be readily apparent as the same becomes better understood by reference to the following detailed description when considered in conjunction with the accompanying drawings, in which like reference symbols indicate the same or similar components, wherein:

[0016] FIG. 1 is a block diagram of a zoom camera with an automatic power-shutoff function according to a preferred embodiment of the present invention; and

[0017] FIG. 2 is a procedural view for explaining a method for automatically shutting off power of the zoom camera with an automatic power-shutoff function according to the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] The present invention will be explained in more detail with reference to preferred embodiments in conjunction with the attached drawings.

[0019] FIG. 1 is a block diagram of a zoom camera with an automatic power-shutoff function according to a preferred embodiment of the present invention.
As shown in FIG. 1, the zoom camera with an automatic power-shutoff function according to the present invention includes a power supply 90, a distance-measuring unit 100, a light-measuring unit 110, a flash device 120, a body tube-moving unit 130, a body tube position detector 140, and a switch 160.

The power supply 90 supplies power required for operating the camera, the distance-measuring unit 100 measures a distance from the camera to a subject for photography, the light-measuring unit 110 measures brightness when photographing the subject, and the flash device 120 supplements the intensity of light radiation if the intensity of light radiation is insufficient when photographing the subject.

The body tube-moving unit 130 includes a zoom motor for moving the body tube from a closed position to a telephoto position, and the body tube position detector 140 outputs a signal corresponding to a focal distance which is changeable according to the position of the body tube.

The controller 150 moves the body tube to a wide-angle position that is a photographing preparation state, by operating the zoom motor of the body tube-moving unit 130 in the case the camera has not operated during a first stop-time period. If the camera has not operated during a second stop-time period, the controller 150 puts the body tube in the closed position after closing a lens cap by operating the zoom motor of the body tube-moving unit 130 again, and thereafter shuts off the power if the camera has not operated. Here, the lens cap is an optional feature, and hence, if the lens cap is not provided, the process of closing the lens cap is not needed. The first stop-time period is a predetermined time period in which the camera does not operate after the previous operation of the camera, and the second stop-time period is a predetermined time period during which the camera does not operate after the first stop-time period.

The switch 160 includes a switch 50 for turning on/off the power supply 90, a release first-step switch 51 for outputting a signal to the controller 150 for measuring a distance from the subject and an exposure amount through the distance-measuring unit 100 and the light-measuring unit 110, a release second-step switch 52 for outputting a signal to the controller 150 for operating a shutter if the distance measuring and the light measuring are accomplished, a teleswitch 53 for outputting a signal to the controller 150 for moving the body tube to the telephoto position by the body tube-moving unit 130, and a wide-angle switch 57 for outputting a signal to the controller 150 for moving the body tube to the wide-angle position.

FIG. 2 is a procedural view for explaining a method for automatically shutting off power of the zoom camera with an automatic power-shutoff function according to a preferred embodiment of the present invention. The method for shutting off power according to the present invention will now be explained in conjunction with the attached FIG. 2.

As shown in FIG. 2, the method for automatically shutting off power of the zoom camera with an automatic power-shutoff function includes the steps of supplying power from the power supply by turning on the power switch (step S200), determining whether the first stop-time period is completed or not (step S210), determining whether the body tube is in a wide-angle position or not (step S220), positioning the body tube in the wide-angle position (step S230), determining whether the second stop-time period is completed (step S240), and shutting off power after the second stop-time period (step S250).

If the power is input from the power supply 90 to the camera as the power switch SO is turned on, the controller 150 determines whether all switches of the camera have not operated during the first stop-time period after the previous operation of the camera (step S210).

The controller 150 determines whether a current position of the body tube is the wide-angle position through the body tube position detector 140, if the controller determines that all switches of the camera have not operated during the first stop-time period (S220).

The controller 150 positions the body tube in the wide-angle position by driving the zoom motor of the body tube-moving unit 130, if the controller 150 determines that the body tube is not in the wide-angle position according to the signal output from the body tube position detector 140 (S230), wherein the controller 150 maintains a current photographing mode and a state able to take a photograph from the step S210 to the step S230, so that a user can take a photograph immediately upon operating the camera.

The controller 150 determines whether all switches of the camera have not operated during the second stop-time period after positioning the body tube in the wide-angle position.

The controller 150 closes the lens cap and puts the body tube in the closed position, and thereafter shuts off the power by turning off the power switch SO, if the controller 150 determines that the camera has not operated during the second stop-time period. Here, the lens cap is an optional feature, and hence, if the lens cap is not provided, the process of closing the lens cap is not needed.

As described above, in the zoom camera with the automatic power-shutoff function and the automatic power-shutoff method thereof according to the present invention, it is possible to protect the body tube from an external impact by positioning the body tube in the wide-angle position while the user does not use the camera during a predetermined time period, and it is further possible for a user to take a photograph instantly when he sees a subject even after non-use of the camera during a predetermined time period, by eliminating the process of turning the power of the camera back on.

What is claimed is:

1. A zoom camera with an automatic power-shutoff function comprising:
   - a power supply for supplying power required for operating the camera;
   - a body tube-moving unit for moving a body tube;
   - a body tube position detector for positioning the body tube in a wide-angle position;
   - a controller for determining whether a current position of the body tube is the wide-angle position;
   - a power switch for turning on and off the power supply.

2. The zoom camera of claim 1, wherein:
   - the controller determines whether the first stop-time period is completed or not.
   - the controller determines whether the second stop-time period is completed.
   - the controller closes the lens cap and positions the body tube in the closed position.

3. The zoom camera of claim 1, wherein:
   - the controller maintains a current photographing mode and a state able to take a photograph immediately upon operating the camera.
   - the controller shuts off the power by turning off the power switch.

4. The zoom camera of claim 1, wherein:
   - the controller protects the body tube from an external impact by positioning the body tube in the wide-angle position.
   - the controller eliminates the process of turning the power of the camera back on.

5. The zoom camera of claim 1, wherein:
   - the controller determines whether all switches of the camera have not operated during the stop-time period.
a body tube position detector for detecting a position of
the body tube;
a controller for analyzing a signal output from the body
tube position detector to move the body tube to a
wide-angle position by operating the body tube-moving
unit if the body tube is not in the wide-angle position
and all switches of the camera have not operated during
a first stop-time period after a previous operation of the
camera, and putting the body tube in a closed position
by operating the body tube-moving unit again and to
shut off the power if all the switches of the camera have
not operated during a second stop-time period after the
first stop-time period; and

a switch including a power switch for turning on/off the
power supply.

2. The zoom camera of claim 1, wherein the controller
maintains a current photographing mode and a photographing
preparation state before the second stop-time period
elapses.

3. The zoom camera of claim 1, wherein the controller
operates the body tube-moving unit again for closing a lens
cap and putting the body tube in a closed position if the
camera does not operate during the second stop-time period.

4. A method for automatically shutting off power of a
zoom camera with an automatic power-shutoff function
including a power supply for supplying power, a body
tube-moving unit for moving a body tube, a body tube
position detector for outputting a signal corresponding to a
focal distance, a controller for shutting off power automati-
cally, and a switch including a power switch, comprising:

supplying power from the power supply by turning on the
power switch;
determining whether all switches of the camera have not
operated during a first stop-time period;
determining whether a current position of the body tube is
in a wide-angle position through the body tube position
detector, if the controller determines that the first
stop-time period has elapsed without any operations of
the camera;

positioning the body tube in the wide-angle position by
driving a zoom motor of the body tube-moving unit, if the
controller determines that the body tube is not in the
wide-angle position;
determining whether all switches of the camera have not
operated during a second stop-time period; and

putting the body tube in a closed position, and thereafter
shutting off the power if the controller determines that
the camera has not operated during the second stop-
time period.

5. The method of claim 4, wherein the controller checks
again whether the first stop-time period has elapsed if the
controller senses an operation of the camera during the
second stop-time period.