

PATENT SPECIFICATION

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(54) ELECTRONIC FLASH DEVICE

(71) We, FRANKE & HEIDECHE GMBH., a German Body Corporate, trading as ROLLEI-WERKE FRANKE & HEIDECHE, of 196 Salzdhahmerstrasse, Braunschweig, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an electronic flash device adapted to be rigidly fitted to a camera.

Known electronic flash devices cooperate with a live viewfinder jaw of the camera, i.e. there is provided on the flash device jaw of the camera a contact which disables the photoelectric transducer of the automatic exposure meter when the flash device is placed in position and switches the automatic exposure mechanism over to fixed resistors whereby the automatic exposure mechanism sets the shutter or aperture stop to a value corresponding to the guide member of the flash device. The camera has thus been converted from daylight operation to flash operation.

In order to reconvert the camera to automatic exposure setting for daylight photography the flash device must be removed from the camera after photographs have been taken by flash means. If the flash device is merely electrically switched off, then conversion of the camera to automatic exposure setting for daylight photography does not take place.

In order to render removing of the flash device unnecessary for reactivating the automatic exposure setting mechanism it would be perfectly feasible to replace the live viewfinder shoe by a manually operable switch for performing the above described re-conversion. But it has become apparent that precisely with such manual conversion

arrangements one tends to forget to switch over when one changes from flash operation to daylight operation and vice versa.

The present invention may eliminate these drawbacks in a separable flash device/camera combination, to make removing of the flash device from the camera unnecessary for daylight exposure and to dispense with a manual switch.

Therefore there may be provided an electronic flash device so that when the flash device is mounted on the camera the latter is converted from daylight to flash operation and vice versa when the "on-off" switch of the flash device is actuated.

According to the present invention there is provided an electronic flash device adapted to be fitted to a camera having an automatic exposure metering system, the flash device including an "on-off" switch for controlling the operation of electronic circuitry within the flash device and a switch protuberance connected with the "on-off" switch so as to protrude through an opening in the flash device when the flash device is switched "on" by an amount indicative of the guide number of the flash device, wherein when the flash device is connected to the camera and is switched into its "on" state the switch protuberance is effective to disable the automatic exposure metering system of the camera and to set the camera exposure elements in accordance with a guide number of the flash device. In an electronic flash device for fitting to a camera having a photoelectric exposure meter with automatic stop setting the switch protuberance then forms or controls an abutment for an aperture stop-determining sensing pointer of the exposure meter.

The user obtains the advantage that no manual control need be switched from automatic to flash working. The switch which is anyway present on the flash device is used for converting the camera. A further

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5 advantage consists therein that the electronic flash device according to the invention also enables photographs to be taken by "fill-in" technique. For this purpose the slider switch must be disconnected after the flash tube in the electronic flash device is primed and before a photograph is taken.

10 In electronic flash devices having a plurality of guide numbers and thus a variable working shutter, the "on-off" switch of the flash device is in the form of a slider switch having detent positions additional to the "on" position. Corresponding stop values in the camera housing are associated with these detent positions. The camera then works with various working stops depending on the guide number of the electronic flash device.

20 In a further development of the invention an intermediary lever may be provided for the purpose of bridging the distance between the switch protuberance of the slider switch and the sensing pointer of the exposure measuring system of the camera. This intermediary lever represents the coupling member between the electronic flash device and the exposure measuring system. So that the intermediary lever should not remain in the last used working stop position after the electronic flash device has been turned off, the lever is provided with a return spring which shifts it out of range of the sensing pointer. It is thereby ensured that after an electronic flash device has been employed the camera is automatically converted to automatic programming for daylight photography.

40 A constructional embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawing.

45 As viewed from the rear, a flash device is designated by the reference numeral 1 and a camera equipped with an automatic programming system by the numeral 2. Flash device 1 and camera 2 are firmly interconnected by a locating arrangement or a screw 18. An electric plug connection 50 19 between camera and flash device simultaneously prevents twisting of the electronic flash device on the camera.

55 On the rear surface of the electronic flash device there are switch contacts 3, 4 which can be connected or disconnected via an attachment 5 of a slider switch 6. The slider switch 6 has at its bent over, narrow, side facing the camera and projecting out of an opening in the flash device 1 a switch protuberance 7 which, when switching on is performed, can enter into the camera housing 2 through a corresponding opening and there forms, via an intermediary lever 9, an abutment for a sensing pointer 65 12 of a photoelectric exposure meter, which

pointer determines the aperture stop. The intermediary lever 9 is provided with a return spring 10 which shifts the lever 9 out of the range of the sensing pointer 12 during non-use of the electronic flash device.

70 The sensing pointer 12 cooperates with a further sensing pointer 11 of the automatic programming system of the camera, this pointer 11 being present on the same measuring instrument. When the electronic flash device is not in use the pointer 11 is urged by the clamping steps 14 against the clamping table 13 and the appropriate aperture stop and shutter-speed is set via a transmission lever 15.

85 In addition to the two detent positions for the on and off switching movement, the slider switch 6 has further detent positions 16 into which a locking ball 8 is adapted to drop and which correspond to corresponding aperture stops in the camera.

90 At its end remote from its pivot point the intermediary lever 9 has a pin 17 which transforms the translatory movement of the switch protuberance 7 into a rotary movement for the sensing pointer 12.

The electronic flash device operates as follows:—

95 When the flash device 1 is fitted to the camera 2 with the switch 6 in its off position, no change takes place in the exposure meter of the camera. The camera continues to operate with automatic programming, i.e. it operates as if the camera were used separately, without the electronic flash device 1. The intermediary lever 9 which is subjected to the bias of the return spring 10 is in normal position and the two sensing pointers 11, 12 are deflected in accordance with the light falling on the exposure measuring system. Just prior to triggering the sensing pointer 11 will be urged by the clamping steps 14 against the clamping table 13 and the appropriate value will be transmitted to the shutter and the aperture stop, with the aid of the transmission lever 15.

105 Only when the slider switch 6 is actuated will the electronic flash device be switched on via the switch contacts 3, 4 and the camera will be switched from automatic programming to flash operation. The switch protuberance 7 now impinges on the intermediary lever 9 and the pin 17 of the intermediary lever is moved into the path of the sensing pointer 12. A basic deflection of the sensing pointer for a specific working stop is thereby preset. The basic deflection is of such magnitude that a specific working stop corresponding to the guide number of the electronic flash device is set. Thus, in addition to the switching-on function of the slider switch 6 of the electronic flash device various working stops corresponding to the guide member are set in 130

the camera via the various detent positions 16.

When the electronic flash device 1 is disconnected the pin 17 of the intermediary lever 9 is again moved out of range of the sensing pointer 12 by the return spring 10, so that the camera 2 is automatically converted to automatic programming.

When the flash device 1 is switched off prior to ignition of the flash tube, then the camera may again operate automatically and the flash tube triggered via the electric connection 19 can be utilised for brightening ("fill-in" technique).

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WHAT WE CLAIM IS:—

1. An electronic flash device adapted to be fitted to a camera having an automatic exposure metering system, the flash device including an "on-off" switch for controlling the operation of electronic circuitry within the flash device and a switch protuberance connected with the "on-off" switch so as to protrude through an opening in the flash device when the flash device is switched "on" by an amount indicative of the guide

number of the flash device, wherein when the flash device is connected to the camera and is switched into its "on" state the switch protuberance is effective to disable the automatic exposure metering system of the camera and to set the camera exposure elements in accordance with a guide number of the flash device.

2. A switch as claimed in claim 1, wherein the "on-off" switch of the flash device is designed as a slider switch which when switched "on" is adapted to be movable into a plurality of detent positions.

3. A device as claimed in claim 2, wherein specific flash guide members are associated with the detent positions.

4. An electronic flash device, substantially as described herein with reference to, and as illustrated by, the accompanying drawing.

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