

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) PHOTOGRAPHIC APPARATUS

(71) We, EASTMAN KODAK COMPANY, a Company organized under the Laws of the State of New Jersey, United States of America, of 343 State Street, Rochester, New York 14650, United States of America, 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 a photographic flashlight adapter for use with a photographic camera (hereinafter referred to as "of the kind defined") having a socket for receiving a multilamp percussion-ignitable flash lamp unit, each lamp of which has a primer for activating the lamp upon being struck by an actuating member within the camera or by a striker which is incorporated within the unit and is dislodged or released by the actuating member within the camera, and wherein the socket is arranged for rotation so as to bring each of the flash lamps successively to a location for activation.

In accordance with the present invention there is provided a photographic flashlight adapter having means for attachment to a photographic camera of the kind defined, said adapter comprising a socket for receiving a multilamp percussion-ignitable flash lamp unit and locating a set of at least two of the flash lamps thereof at operative sites, and means actuable by the camera actuating member for simultaneously activating ignition of the flash lamps received at the operative sites.

Reference will now be made to the single figure of the accompanying drawing which is a pictorial view of an adapter according to the invention, positioned for mounting on a percussion flash camera, with a multilamp percussion-ignitable flash unit inserted in the adapter. Portions of the camera, the multilamp flash unit, and the adapter are removed to reveal the working components of the embodiment.

Referring now to the drawing, an adapter 10 is positioned to be mounted on a percussion flash camera 12. A multilamp flash unit 14 comprising a plurality of percussion-ignitable flash lamps 80, is inserted in adapter 10. Camera 12 is of a well known type. It includes a shutter release lever 30, which is biased upwardly and movable downwardly by a shutter release mechanism (not shown), which is operable by the camera operator. A finger 32 extends upwardly from lever 30. A drive member 34 is rotatably mounted on pivot 36 and is biased in a counterclockwise direction by a spring 38. One leg 40 of drive member 34 is shown in its initial position in engagement with finger 32, so that member 34 is prevented from rotating about pivot 36. An upwardly extending arm 42 of drive member 34 terminates in a cam surface 44.

The percussion flash components of camera 12 include an actuating member 46, aligned with an aperture 48 in the top wall of camera 12. An ear 50 extends from the base of actuating member 46 and is engageable by cam surface 44 of drive member 34, as drive member 34 rotates in a counterclockwise direction. A shutter 52 is rotatably mounted on a pivot 54 and is biased in a counterclockwise direction about pivot 54 by a spring (not shown). Shutter 52 has an ear 56 on a portion of the shutter extending above pivot 54. It may be seen that, upon downward movement of lever 30, drive member 34 will be freed to rotate in a counterclockwise direction under the bias of spring 38, whereupon leg 40 will contact ear 56 to rotate shutter 52 and cam surface 44 will contact ear 50 to drive actuating member 46 upwardly.

Socket 60 is located in the top wall of camera 12 and includes a centre post 62, channels 64 and resilient fingers 66 which are designed to receive multilamp flash units carrying percussive type flash lamps. Socket 60 is rotatable by 90° in response to movement of upwardly extending leg 68 of drive member 34, as drive member 34 is

moved to its cocked position in response to operation of the film advance mechanism. Alternatively, camera 12 could include means for automatically rotating socket 60 with each operation of the shutter. Both such mechanisms are well known in the art.

Multiflash unit 14, also of a type well known, comprises a plurality of percussion flash lamps 80 or other lamps ignitable by striking, and a base 82 having a set of walls and recesses which mate with the corresponding centre post 62, channels 64 and resilient fingers 66 in socket 60 to secure multiflash unit 14 on camera 12. For each flash lamp 80 a striker 84 is held in a pre-energized position from which it is releasable to fire its respective lamp by striking. When multiflash unit 14 has been secured on camera 12 and is in position so that a flash lamp 80 is facing in the direction of shooting, a striking element 84 is aligned over aperture 48 in camera 12. As multiflash unit 14 is indexed, a new striking element which will ignite a new forward facing flash lamp is aligned over aperture 48.

Adapter 10 comprises a support and orientation means, for example, a drive coupler 100, a drive wheel 102, drive gearing 204, a rotatable socket 104, and a flash firing or actuating member 106. Depending from the base of adapter 10 is wall 108 and a centering pin 110. Wall 108 is adapted for engaging the wall of camera 12 on which adapter 10 is mounted, while pin 110 is adapted to enter an aperture 112 in the top wall of camera 12. Either wall 108 or pin 110, or both, may be used to aid in positioning adapter 10 on the camera 12 when mounting the adapter and to prevent rotation of adapter 10 with respect to camera 12.

Drive coupler 100 extends downwardly from adapter 10 and is adapted to receive centre post 62 within a recess (not shown) in its interior. Drive coupler 100 further includes walls 114 which pass into corresponding channels 64 and recesses (not shown) which are engageable by resilient fingers 66 so that adapter 10 is received by and coupled with socket 60 of camera 12. Coupler 100 will then transmit rotary movement of socket 60 to drive wheel 102. Drive wheel 102 rotates socket 104 through drive gearing 204. Socket 104 is similar to camera socket 60 and is adapted to receive a multiflash unit 14.

Adapter 10 further includes an aperture 120 which is aligned with aperture 48 in camera 12 when adapter 10 has been positioned on camera 12. Actuating member 106 includes an outwardly extending ear 122 which is accessible through aperture 120 in the base of adapter 10. Member 106 is rotatably mounted at end 126 and further includes a pair of upwardly extending

fingers 124. Adapter 10 further includes a spring 128 which bears against socket 104 and arrests rotation of socket 104 so that two adjacent flash lamps 80 are each directed at an angle of 45° relative to the direction of picture taking. Each one of fingers 124 on actuating member 106 will then be aligned with the striking element 84 of the flash lamps 80 which are in a firing position.

In the following explanation of the operation of the invention, it is assumed that an adapter 10 has been mounted on camera 12 as described above, with a multiflash unit 14 inserted into socket 104 of adapter 10 and that all components of camera 12 are cocked and an exposure is about to be made. When the shutter release lever 30 is depressed, finger 32 becomes disengaged from leg 40 of drive member 34, and member 34 rotates in a counterclockwise direction under the influence of spring 38, leg 40 striking ear 56 of shutter 52, with sufficient force to cause shutter 52 to rotate in a clockwise direction against its spring bias to open the exposure aperture of camera 12. While shutter 52 is thus opening, cam surface 44 of drive member 34 engages finger 50 of actuating member 46, thereby driving actuating member 46 through aperture 48 of camera 12. Actuating member 46 also passes through aperture 120 of adapter 10 which is aligned with aperture 48, and then engages and forces upwards ear 122 of actuating member 106. As ear 122 is forced upwards, actuating member 106 rotates about pivot 126, thereby causing fingers 124 to move upwards and to release the striking elements 84 of the forward facing flash lamps 80, causing ignition of flash lamps 80. A maximum opening of the camera shutter 52 should be timed to correspond with the maximum output of the flash lamps 80. To complete an exposure, shutter 52 is returned to its initial position to close the exposure aperture, and shutter release lever 30 is moved upwardly to its initial position.

When the film advance mechanism of camera 12 is actuated, drive member 34 is engaged and rotated in a clockwise direction against the bias of spring 38, thereby returning drive member 34 to its initial position wherein leg 40 is engaged by finger 32. Cam surface 44 is thereby moved out of engagement with ear 50 of actuating member 46, thereby permitting actuating member 46 to move downwardly to its initial position and freeing actuating member 106 for rotation downwardly so that ear 122 again rests over aperture 120. As drive member 34 is rotated in a clockwise direction, upwardly extending finger 68 rotates socket 60 through an angle of 90°. Adapter wheel 102 is rotatably coupled to

adapter base 100 and in turn drives socket 104 through drive gearing 204. Gearing 204 drives socket 104 through an angle of 180° in response to rotation of socket 60 through 90° , thereby presenting a new pair of flash lamps in position such that each is oriented at an angle of 45° with respect to the direction of shooting with their striking elements 84 aligned over fingers 124 of actuating member 106.

WHAT WE CLAIM IS:—

1. A photographic flashlight adapter having means for attachment to a photographic camera of the kind defined, said adapter comprising a socket for receiving a multilamp percussion-ignitable flash lamp unit and locating a set of at least two of the flash lamps thereof at operative sites, and means actuatable by the camera actuating member for simultaneously activating ignition of the flash lamps received at the operative sites.

2. A photographic flashlight adapter according to Claim 1, wherein the attachment means, when the adapter is mounted on the camera, couples the adapter socket to the camera socket for rotation of the adapter socket in response to rotation of the camera socket, so as to locate a further set of flash lamps of a

received flash lamp unit, at the operative sites.

3. A photographic flashlight adapter according to Claim 2, wherein the attachment means includes a drive coupler which is engageable in the camera socket and is coupled to the adapter socket by means of gearing to transmit the rotation of the camera socket to the adapter socket.

4. A photographic flashlight adapter according to Claim 1, 2 or 3, wherein the adapter socket is adapted to receive a flash lamp unit containing four flash lamps and to locate two flash lamps thereof at operative sites.

5. A photographic flashlight adapter according to Claim 4 wherein the ignition activating means comprises a pivotally mounted actuating member having a pair of actuating fingers for activating ignition of two flash lamps located at the operative sites and an ear which, when the adapter is mounted on the camera, is engageable by the camera actuating member.

6. A photographic flashlight adapter for simultaneously firing a pair of percussion-ignitable flash lamps, substantially as hereinbefore described, with reference to, and as shown in, the accompanying drawing.

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