

PATENT SPECIFICATION (11)

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(54) TESTING OF PHOTOGRAPHIC FLASHLIGHT ACTUATING MECHANISMS

(71) We, KODAK LIMITED, a company registered under the Law of England, of Kodak House, Station Road, Hemel Hempstead, Hertfordshire, 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:—

10 The present invention relates to the testing of actuating mechanisms for photographic flashlight devices adapted to use percussion ignitable flash lamp units, and to apparatus for effecting such testing.

15 Percussion ignitable flash lamp units as referred to in this specification comprise one or more flash lamps, the or each flash lamp having a primer and a striker which, upon being released from a pre-stressed latched position, strikes the primer to activate the lamp. Such flash lamp units have been developed recently and have the advantage that they do not require a source of electricity for firing. However they require to be used on a flashlight device, hereinafter referred to as the kind described, which has been developed recently and comprises socket means for holding a flash lamp in predetermined position, and an actuating mechanism which responds to operation of the shutter release mechanism of a photographic camera associated with the flashlight device by moving a striker releasing member to unlatch the striker of the flash lamp which is held in the predetermined position. In order to release the striker a predetermined force must be applied to the striker as the striker is moved through a predetermined distance.

40 A method, in accordance with the invention, of testing an actuating mechanism of a photographic flashlight device of the kind described comprises applying a predetermined load to the striker releasing member of the actuating mechanism during operation of the actuating mechanism and with-

out a flash lamp unit thereon, to simulate the resistance of a striker, and verifying that the resultant movement of the striker releasing member is within predetermined tolerances. Thus the striker releasing member may be required to move through a predetermined distance, and it may be required to move through this distance in a predetermined time. Further, the striker releasing member may be required to have moved through the predetermined distance in synchronism with the operating cycle of a camera shutter associated therewith.

To ensure that the striker releasing member has moved through the predetermined distance the load may be applied to this member by means that is biased to move laterally out of engagement with the member when it has moved through the predetermined distance.

Apparatus for testing an actuating mechanism in accordance with the present invention is provided with means for engaging the striker releasing member of the actuating mechanism and applying a predetermined load thereto following actuation of the actuating mechanism while permitting the striker releasing member to move in its actuating direction, and means for indicating when the striker releasing member has moved through a predetermined distance.

The means for engaging the striker releasing member and applying the predetermined load may comprise a spring, and indicating means responsive to movement of the spring, of a member carried by the spring, past a predetermined point.

The spring may have a sideways set such that it tends to move sideways against a retaining wall and can move laterally to cause a response of the indicating means when it reaches the predetermined point which is at one end of the retaining wall. Alternatively the spring may carry a member which is biased laterally of the wall for the same purpose.

The method of testing, and one embodiment of testing apparatus, in accordance with the invention, will now be further described by way of example with reference to the diagrammatic drawings accompanying the Provisional Specification in which:—

Figure 1 is a part-sectional side view of the apparatus shown in operative position on a flashlight device incorporated in a camera;

Figures 2 and 3 are sectional views of the apparatus only, taken on the line II—II and III—III respectively of Figure 1.

Referring to Figure 1 of the drawings, a camera 1 is shown as having a flashlight device 2 built into the upper part of its casing. This device 2 comprises a datum face 3, a central seating 4 for a percussion-ignitable flash lamp unit generally in the form of a cube. A suitable flash lamp unit for use on the flashlight device, enclosing four flash lamps each with its associated reflector and pre-energised striker is described in Patent Application No. 49434/69 (Serial No. 1,287,293).

The device 2 also incorporates an actuating mechanism which includes a rod-like striker releasing member 5 coupled by means not shown to the shutter release mechanism of the camera. The striker releasing member 5 is positioned with respect to the central seating 4 so as to be aligned with the appropriate striker channel in a flash lamp unit mounted on the device 2. In operation of the flashlight device, the striker releasing member 5 is moved longitudinally by the shutter release mechanism into the striker channel. In doing so it moves through a predetermined distance and encounters resistance from the striker until it releases the striker from its energised condition. The striker releasing member 5 can then continue to move in the same direction under the influence of the shutter release mechanism but this movement is not now resisted by the striker so that the overtravel of the shutter release mechanism occurs without hindrance.

The method of testing this actuating mechanism for the flashlight device involves applying a predetermined load to the striker releasing member 5 as this member moves through a predetermined distance during simulated operation and checking that the striker releasing member has moved through at least one predetermined position at an instant related to the operating cycle of the shutter release mechanism.

The embodiment of testing apparatus shown in the drawings comprises a support 10 arranged to carry a spindle 11 with its axis in a general vertical orientation. The lower end 12 of the spindle 11 is formed to simulate the base of a flash lamp unit, and a platform unit 13 mounted on and surrounding the spindle 11 can engage the datum face

3 of the camera further to assist correct positioning of the testing apparatus on the camera. The support 10 includes a downwardly depending portion 14 which carries a horizontally extending pillar 15 shown in Fig. 3. Mounted coaxially on the pillar 15 is the coiled end of a tension spring 16 whose adjacent end 17 is trapped in an axial slot 18 in an annular member 19 which can be locked in a desired angular position on the pillar 15 by a locking screw 20. The other end 21 of the spring 16 is relatively straight and extends to rest on an upper side 22 of the platform unit 13. A retaining wall 23 extends a predetermined distance vertically from the upper side 22 and the spring 16 has a sideways set such that the end 21 is biased against this wall 23. On slackening the locking screw 20 the tension of the spring can be adjusted to vary the loading applied to the upper side 22. If spring end 21 is raised sufficiently, in opposition to this loading, it will tend to move laterally on to the upper side 24 of the retaining wall 23 where it will be retained until reset. In moving laterally on to the upper side 24 of the retaining wall 23 the spring end 21 engages and actuates the actuating arm 25 of a microswitch 26. Resetting of the spring end 21 can be effected by a vertically movable plunger 27 having a cam surface 28 for moving the spring end 21 laterally clear of the upper side 24 of the retaining wall 23. The plunger 27 is not visible in Figure 1, being on the observer's side of the wire end 21 and to the right of the spindle 11.

When the apparatus is positioned correctly on the camera the spindle end 12 engages in the actuating mechanism of the flashlight device to set the camera for flash operation and to raise the striker releasing member 5 to touch but not lift the spring end 21. If the shutter release is now actuated the striker releasing member 5 will lift the spring end 21. The spring end 21 should be lifted above the retaining wall 23 within a predetermined time if the camera is such that a satisfactory flash can occur.

Thus the apparatus consists essentially of a spring wire with adjustable tensioning and sideways set arranged so that the action of triggering the shutter release mechanism requires the camera actuating mechanism to lift the preset spring load through a predetermined distance (which corresponds approximately to the height of the retaining wall 23).

The apparatus will include or be associated with timing means for determining the time taken, after actuation of the shutter release, for the microswitch 26 to be actuated. For example an electrical timing circuit, closed upon actuation of an electric switch in the testing apparatus when the shutter release member is actuated, may indicate if

the time taken is within acceptable tolerances.

Several modifications of the apparatus may be made whilst still embodying the present invention. Thus the timing means need not incorporate the microswitch 26 but could comprise a light-beam operated photocell to detect movement, transverse or otherwise, of the spring above the retaining wall. Moreover the spring end 21 could merely move vertically in this case. The spring end 21 could also move only in a vertical direction if it carried a part which is biased in the sideways direction to operate a microswitch on clearing the retaining wall. Resetting of the spring end 21 can be effected by a plunger, lever or cam, and can be effected alone or in conjunction with some other operation such as positioning the apparatus on a camera.

WHAT WE CLAIM IS:—

1. A method of testing an actuating mechanism of a photographic flashlight device of the kind described, comprises applying a predetermined load to the striker releasing member of the actuating mechanism during operation of the actuating mechanism and without a flash lamp unit thereon, to simulate the resistance of a striker, and verifying that the resultant movement of the striker releasing member is within predetermined tolerances.

2. A method as claimed in Claim 1, wherein the time taken for the striker releasing member to move through a predetermined distance against the applied load is tested.

3. A method as claimed in Claim 2, wherein the synchronism of operation of the striker releasing member with the operation of the shutter of a camera associated with the flashlight device is tested.

4. Apparatus for testing an actuating mechanism of a photographic flashlight device of the kind described comprising means for engaging the striker releasing member of the actuating mechanism and applying a pre-

determined load thereto following actuation of the actuating mechanism while permitting the striker releasing member to move in its actuating direction, and means for indicating when the striker releasing member has moved through a predetermined distance.

5. Apparatus as claimed in Claim 4, wherein the means for applying the predetermined load to the striker releasing member comprises a spring, and wherein the indicating means is responsive to movement of the spring, or of a member carried by the spring, past a predetermined point.

6. Apparatus as claimed in Claim 5, wherein the spring has a sideways set such that it tends to move sideways against a retaining wall and can move laterally to cause a response of the indicating means when it reaches the said predetermined point which is at the end of the retaining wall.

7. Apparatus as claimed in Claim 5, wherein the spring carries a member which is biased laterally of a retaining wall and which member can move laterally to cause a response of the indicating means when it reaches the said predetermined point which is at one end of the retaining wall.

8. Apparatus as claimed in Claim 5, wherein the indicating means is responsive to the operation of a microswitch.

9. Apparatus as claimed in Claim 5, wherein the indicating means incorporates a photocell which is responsive to movement of the spring or member past the said predetermined point.

10. Apparatus as claimed in Claim 4, including setting means engageable in the actuating mechanism of a photographic camera on which the flashlight device is mounted, the setting means being arranged to set the camera for flash operation.

11. Testing apparatus substantially as hereinbefore described with reference to the drawings accompanying the Provisional Specification.

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Several modifications of the apparatus may be made whilst still embodying the present invention. Thus the timing means need not incorporate the microswitch 26 but could comprise a light-beam operated photocell to detect movement, transverse or otherwise, of the spring above the retaining wall. Moreover the spring end 21 could merely move vertically in this case. The spring end 21 could also move only in a vertical direction if it carried a part which is biased in the sideways direction to operate a microswitch on clearing the retaining wall. Resetting of the spring end 21 can be effected by a plunger, lever or cam, and can be effected alone or in conjunction with some other operation such as positioning the apparatus on a camera.

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1. A method of testing an actuating mechanism of a photographic flashlight device of the kind described, comprises applying a predetermined load to the striker releasing member of the actuating mechanism during operation of the actuating mechanism and without a flash lamp unit thereon, to simulate the resistance of a striker, and verifying that the resultant movement of the striker releasing member is within predetermined tolerances.

2. A method as claimed in Claim 1, wherein the time taken for the striker releasing member to move through a predetermined distance against the applied load is tested.

3. A method as claimed in Claim 2, wherein the synchronism of operation of the striker releasing member with the operation of the shutter of a camera associated with the flashlight device is tested.

4. Apparatus for testing an actuating mechanism of a photographic flashlight device of the kind described comprising means for engaging the striker releasing member of the actuating mechanism and applying a pre-

determined load thereto following actuation of the actuating mechanism while permitting the striker releasing member to move in its actuating direction, and means for indicating when the striker releasing member has moved through a predetermined distance.

5. Apparatus as claimed in Claim 4, wherein the means for applying the predetermined load to the striker releasing member comprises a spring, and wherein the indicating means is responsive to movement of the spring, or of a member carried by the spring, past a predetermined point.

6. Apparatus as claimed in Claim 5, wherein the spring has a sideways set such that it tends to move sideways against a retaining wall and can move laterally to cause a response of the indicating means when it reaches the said predetermined point which is at the end of the retaining wall.

7. Apparatus as claimed in Claim 5, wherein the spring carries a member which is biased laterally of a retaining wall and which member can move laterally to cause a response of the indicating means when it reaches the said predetermined point which is at one end of the retaining wall.

8. Apparatus as claimed in Claim 5, wherein the indicating means is responsive to the operation of a microswitch.

9. Apparatus as claimed in Claim 5, wherein the indicating means incorporates a photocell which is responsive to movement of the spring or member past the said predetermined point.

10. Apparatus as claimed in Claim 4, including setting means engageable in the actuating mechanism of a photographic camera on which the flashlight device is mounted, the setting means being arranged to set the camera for flash operation.

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