Nov. 3, 1970 C. W. MICHATEK 3,537,805

Z-SHAPE STRIKER SPRING FOR PERCUSSION-IGNITABLE, MULTILAMP FLASH UNITS

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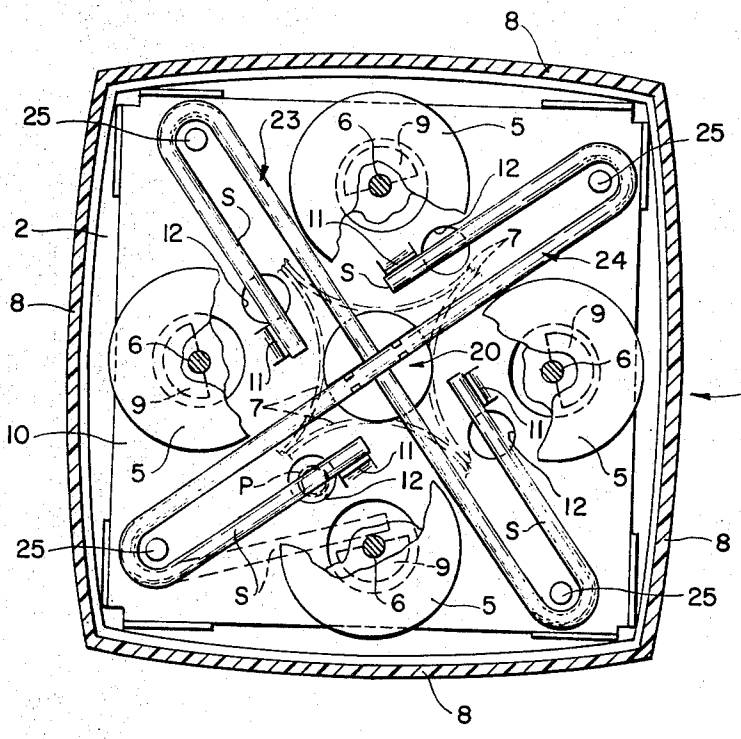


FIG.1

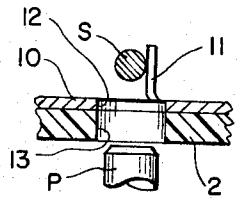


FIG.4

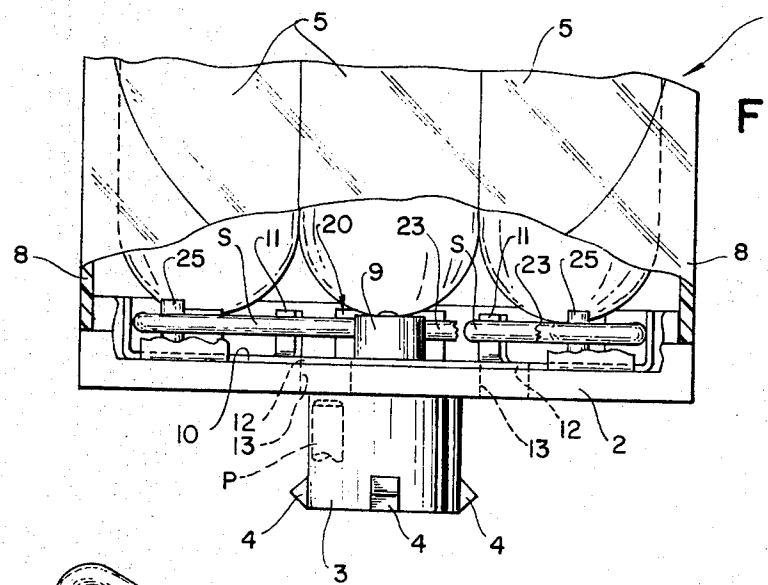


FIG.2

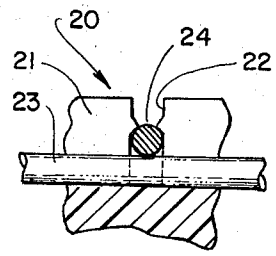


FIG.5

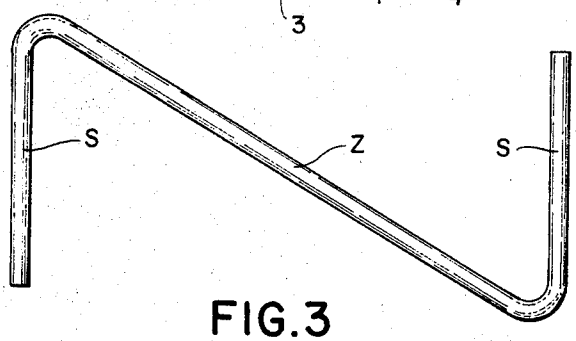


FIG.3

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Z-SHAPE STRIKER SPRING FOR PERCUSSION-IGNITABLE, MULTILAMP FLASH UNITS

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Int. Cl. F21k 5/02
U.S. Cl. 431—93 6 Claims

ABSTRACT OF THE DISCLOSURE

A multilamp photoflash unit is disclosed having a plurality of percussion- ignitable flash lamps mounted on a base. A spring member of generally planar, Z-shaped configuration is mounted in a flat orientation on the base of the flash unit. Sheared-up portions of a metal plate on the unit base are located to restrain striker portions of the Z-spring at energized positions, stressed inwardly towards the connecting portion of the spring. Upon release from its restraint, a striker portion moves outwardly into percussion impact with an associated flash lamp.

CROSS-REFERENCE TO RELATED APPLICATIONS

Reference is made to commonly assigned copending U.S. application Ser. No. 765,930, entitled, "Multilamp Flash Unit," filed Oct. 8, 1968, in the name of David E. Beach and U.S. application Ser. No. 766,751, entitled, "Percussion-Ignitable Flash Unit Having Contact-Actuatable, Pre-Energized Strikers and Photographic Apparatus Using Such Units," filed Oct. 11, 1968, in the names of Joseph V. Poweska and Jeffrey R. Stoneham.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to flash photography and more particularly to an improved, percussion-ignitable, multiplamp photoflash unit.

Description of the prior art

Recently, in order to obviate the necessity for providing an electrical source and circuit in photoflash apparatus, a percussion-ignitable photoflash lamp has been developed. One such percussion-ignitable flash lamp is disclosed in U.S. application Ser. No. 765,930, entitled, "Multilamp Flash Unit," filed Oct. 8, 1968, in the name of David E. Beach. Such units in general employ lamps having an envelope containing a combustible material such as shredded zirconium foil and a combustion supporting gas such as oxygen, sealed in the envelope at a pressure of several atmospheres. A percussion activatable ignition tube is provided at the bottom end of such lamps, with the top of the ignition tube opening into the lamp envelope and the bottom end of the tube closed and extending outside the envelope to a location suitable for percussion striking. The ignition tube contains an anvil rod coated with percussion-sensitive material such as a mixture of zirconium and fulminate; and, upon striking of the tube the material is activated and ignites the combustibles in the envelope through the open end of the ignition tube.

Another type of percussion-ignitable photoflash unit is disclosed in U.S. application Ser. No. 766,751, entitled, "Percussion-Ignitable Flash Unit Having Contact-Actuatable, Pre-Energized Strikers and Photographic Apparatus Using Such Units," and filed Oct. 11, 1968, in the names of Joseph V. Poweska and Jeffrey R. Stoneham. The flash unit disclosed in this latter application employs percussion-ignitable flash lamps of the type described above; however, this unit includes individual pre-

energized torsion spring striker elements for the flash lamps, which elements are selectively released by actuating mechanism in the photographic apparatus using the flash unit and move into contact with an ignition tube of their associated flash lamp to fire the flash lamp.

The above-described units with pre-energized spring striker elements have been found to operate quite satisfactorily; however, the upwardly extending torsion drive portions of the striker have created difficulties in fabrication of such flash units and, in some instances, have presented excessive height requirements for the flash unit. Another problem is presented by the fact that when molded plastic stop structure is utilized to restrain striker springs in an energized condition for long periods of time, "cold flow" occurs in the plastic causing either unintended release of the strikers or difficulty in intended release.

SUMMARY OF THE INVENTION

The present invention is directed to the problems outlined above and in general provides an improved construction of percussion-ignitable, multilamp flash unit of the type having individual pre-energized striker elements for each flash lamp. In accordance with one feature, the present invention provides a spring member which is of generally flat, Z-shaped configuration. The spring is mounted in a flat orientation on the base of a flash unit with its central portion confiined by structure on the flash unit base and its opposed arms restrained inwardly towards the central portion in an energized condition. Another feature of the present invention provides a metal insert which is mounted on the flash unit base and has portions extending upwardly to form the stops for restraining the arm portions of the Z-spring striker in the energized condition, thereby eliminating the problem of cold flow.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top view of a multilamp flash unit with portions removed for illustration and showing an embodiment of the present invention;

FIG. 2 is a front view of the flash unit shown in FIG. 1 with portions of the front wall and of spring elements cut away for illustration;

FIG. 3 is a top view of a spring element such as shown in FIG. 1, but in an unstressed condition;

FIG. 4 is a sectional view of a portion of the flash unit base showing detail of the access site and restraining structure; and

FIG. 5 is a sectional view of the center portion of the flash unit base showing details of the structure confining the striker springs.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

In FIGS. 1 and 2 it can be seen that the flash unit **1** comprises a base **2** which suitably can be molded of plastic and which includes a downwardly extending retaining post **3** with ramped lugs **4** that are adapted to be received in a socket of known construction on photographic apparatus.

Mounted in a circular arrangement in the opposite side of base **2** from post **3** are a plurality of flash lamps **5** having their ignition tubes **6** embedded in the base. Individual reflectors **7** are provided for each flash lamp to direct illumination therefrom through transparent walls **8** of the unit. The base **2** can be provided with backup portions **9** supporting each ignition tube **6** on the opposite side from its respective striking zone.

Mounted on the same side of base **2** as the flash lamps **5** is a generally flat metal plate **10** in which are provided openings for ignition tubes **6**, sheared-up stop members **11**

and access openings **12**. The access openings **12** are aligned with similar openings **13** in the unit base **2** and each stop member **11** is located in a predetermined position with respect to striker elements S which are subsequently to be described.

In the central portion of the base **2** a mounting post **20** is provided which has a pair of orthogonal grooves **21** and **22** of different depths and adapted to receive respectively a pair of spring members **23** and **24** in orthogonal relation as shown in FIGS. 1 and 5. The groove **22** for top spring **24** is necked slightly at the top; so that when spring **24** is snapped in groove **22** above spring **23**, both springs are confined in post **20** in a manner allowing transmission of resilient restoring forces. The base **2** also can be provided with locating lugs **25** shown in FIG. 1 or those lugs can be formed as portions of metal plate **10**.

When a Z-shaped spring Z, such as is shown in FIG. 3, has been inserted in central mounting post **20**, around the locating lugs **25**, and the striker portions S stressed to a position behind stops **11** as shown in FIG. 1, it can be seen that each of Z springs **23** and **24** provides two striker elements S having portions located over access sites **12** and adapted on release to move into precussion impact with an ignition tube **6** of an associated flash lamp **5**.

As can be seen in FIGS. 1, 2 and 4, when a plunger P from associated photographic apparatus is moved upwardly through an aligned access site **12**, the spring striker portion S associated with that site is moved above its related stop **11**. The released striker portion S then is moved into percussion impact with a related ignition tube **6** by the spring forces stored in the entire length of the spring.

Locating lugs **25** cooperate with a released portion S and its related ignition tube to provide suitable restraint to assure proper firing by the opposite striker portion S of that spring.

It has been found that the above-described configuration of spring provides a high impact velocity which is desirable in effecting percussion ignition of the flash lamps. Also it has been found that by stressing the spring striker portions inwardly towards the main spring body, the fatigue loss of the spring is highly reduced.

It will be appreciated from the above description that the present invention provides a readily fabricated and compact multilamp flash unit of the type having individual pre-energized percussion striking elements for each lamp.

The invention has been described in detail with particular reference to preferred embodiments thereof but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. In a multilamp photoflash unit of the type having a plurality of percussion-ignitable flash lamps mounted on a base the improvement comprising:

(a) a spring member having a planar, generally Z-shaped configuration with an intermediate portion connecting two striker arms;

(b) means for confining a generally central section of said intermediate portion of said member on the unit base between flash lamps of the unit; and

(c) a pair of stop members formed on said unit and respectively located at a position to restrain said striker arms of said spring in an energized condition resiliently urged towards said flash lamps.

2. The invention defined in claim **1** wherein said striker arms are stressed towards said intermediate portion and resiliently urged away from said intermediate portion.

3. The invention defined in claim **1** including a plurality of pairs of flash lamps and a plurality of confined spring members with associated stops.

4. The invention defined in claim **1** comprising access sites in said base located adjacent the stressed position of said spring arms and wherein said spring member is located on said base so that upon release of said spring arms from said energized condition, said arms move into percussion impact with an associated flash lamp on said base.

5. The invention defined in claim **1** wherein said base includes a metal plate having upstanding portion forming said stop members.

6. A multilamp photoflash unit comprising:

(a) a base having a central portion;

(b) a plurality of percussion-ignitable flash lamps mounted on said base around said central portion;

(c) a pair of spring members, each having a planar, generally Z-shaped configuration with an intermediate portion connecting two striker portions;

(d) means on said central portion of said base for confining said intermediate portions of said spring members; and

(e) a plurality of stop members, each formed on said base at a location for restraining an arm portion of a spring member in an energized condition, stressed towards its intermediate spring portion and resiliently urged towards a flash lamp.

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EDWARD J. MICHAEL, Primary Examiner

U.S. Cl. X.R.

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