

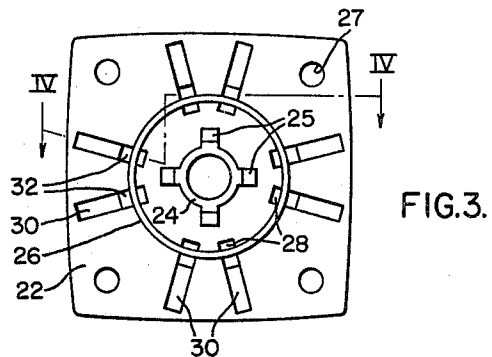
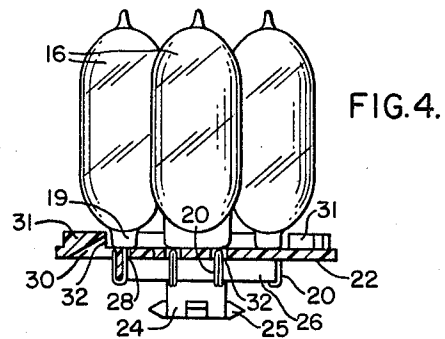
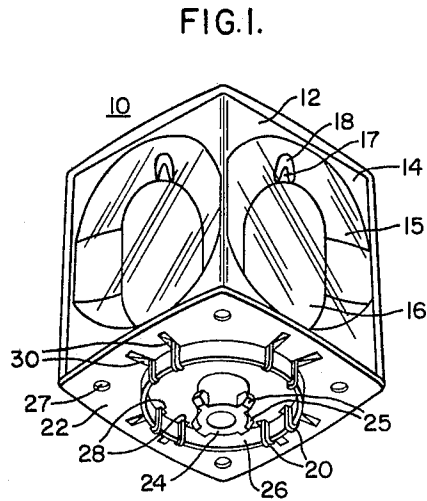
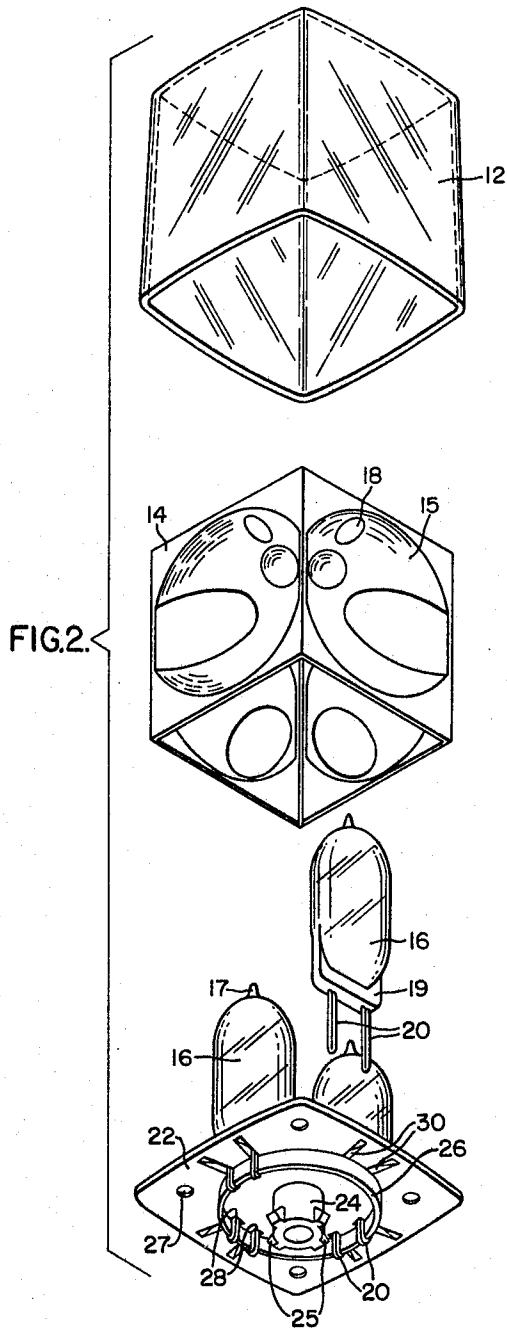
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BASE AND CONTACT STRUCTURE FOR A MULTIFLASHLAMP UNIT

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WITNESSES

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BASE AND CONTACT STRUCTURE FOR A MULTI-FLASHLAMP UNIT

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5 Claims

ABSTRACT OF THE DISCLOSURE

A multiflash lamp unit, such as a flashcube, having a pair of dual-strand wire contacts for each lamp in the unit. The contacts are made by forming each of the lead wires into a dual-strand wire conductor, bending the latter over the rim of a protruding collar on the base member, and recessing the bent ends of the conductors within radially-extending slots provided in the outer face of the base member.

BACKGROUND OF THE INVENTION

This invention relates to photographic flashlamps and has particular reference to a multiflashlamp unit having an improved base and contact structure.

There has recently been developed disposable flashlamp units which contain a plurality of photoflash lamps that are enclosed, together with a corresponding member of reflectors, in a transparent plastic container. A unit of this type containing four miniature photoflash lamps, known in the trade as a "flashcube," is presently being marketed and is described in U.S. Patent No. 3,244,087 issued Apr. 5, 1966 to L. F. Anderson et al.

It is the practice in the prior art devices to provide contacts for the individual flashlamps by bending the lamp lead wires around a projecting collar portion of the base member and then locking them in place by crimping or staking the ends of the wires in holes located at the foot of the collar. A flashcube having a base and contacts constructed in this manner is disclosed in Netherlands patent application No. 6,516,235 filed Dec. 14, 1965, by the Sylvania Electric Products, Inc. and opened to inspection on June 15, 1966.

While the aforesaid construction is generally satisfactory it presents certain manufacturing and quality problems. For example, it is quite difficult to locate the ends of the lead wires and crimp them into the holes provided in the base member and thus frictionally lock the leads in place in the manner described in the aforesaid Netherlands patent application, particularly on a mass production basis. In addition, the crimping operation inherently produces a "pull" on the leads which creates stresses in the press seals and sometimes causes "hair-line" leaks to develop which contaminate and ruin the lamps.

Last but not least, since each of the lamp contacts consists of a single wire, the lamps may not fire when the camera shutter is actuated if the lead wires are dirty, oxidized or damaged in any way as to effect a high-resistance connection with the electrical contacts of the camera—particularly if the flashgun batteries are weak.

SUMMARY

It is accordingly the general object of the present invention to provide an improved base and contact structure for a multi-photoflash lamp unit that will overcome or alleviate the aforementioned manufacturing and quality problems.

Another and more specific object is the provision of a

base-and-contact assembly for a flashcube which will permit the contacts to be formed from the lead wires and securely locked in place automatically on a mass production basis without adversely affecting the quality of the lamps, and which will give added insurance that a positive electrical connection will be effected with the camera contacts when the flashcube is in use.

The aforesaid objectives and other advantages are achieved in accordance with the present invention by forming the exposed ends of each of the lead wires into a dual-strand conductor and modifying the configuration of the base member to permit the dual-strand wire conductors to be wrapped around the protruding collar portion and then merely recessed within the base without any crimping or similar operation. More specifically, during the mounting operation the lead wires are bent into closed U-shaped loops. The mounts are then sealed into the bulbs in such a manner that the retroverted ends of the leads are embedded and securely anchored in the press seal. The resulting dual-strand wire conductors are then threaded through suitable apertures in the base member and bent around the base collar in such a manner that the ends of the conductors swing through tapered slots formed in the outer surface of the base member and are automatically recessed within the slots. The "pull" on the lead wires is thus drastically reduced and the danger of producing strains and leaks in the press seal is, in the main, eliminated.

Each of the lamps is, accordingly, provided with a pair of dual-strand wire contacts, thus doubling the contact surface area provided in the prior art flashcubes and giving added assurance that a positive low-resistance connection will be made with the camera contacts when the lamps are successively indexed into firing position. The increased stiffness of the dual-strand conductors also minimizes the bent lead problems which occur during the bulk handling of the lamps in the factory and the various operations required to assemble the flashcube. The rounded ends of the looped conductors also facilitate the traying of the lamps during the lacquer-dipping operation and the subsequent threading of the conductors into the base member.

BRIEF DESCRIPTION OF THE DRAWING

A better understanding of the invention will be obtained by referring to the accompanying drawing, wherein:

FIGURE 1 is a perspective view on an enlarged scale of a flashcube embodying the improved base and contact construction of the present invention;

FIG. 2 is an exploded pictorial view of the various flashcube components illustrating the manner in which the lamps are assembled with the base member;

FIG. 3 is a plan view of the base component shown in FIGS. 1 and 2; and

FIG. 4 is a side elevational view of the lamp-base assembly, showing a section through the base component along line IV—IV of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 there is shown a disposable multiphotoflash lamp unit or so-called flashcube 10 which embodies the preferred form of the present invention and comprises, in general, a cubical light-transmitting plastic container 12 that encloses four reflector elements 14 and a corresponding number of miniature photoflash lamps 16 that are located between the concave portions 15 of the reflectors and the side walls of the container. The open end of the container 12 is fitted with a base member 22 of molded plastic, the side edges of which are fastened to the edges of the container. As will be noted, the sealed tips 17 of the flashlamps 16 are disposed in recesses 18

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formed in the reflectors 14 and thus help to keep the lamps and reflectors in proper alignment.

The base member 22 is generally square shaped and is provided with a centrally-located hollow spindle 24 having four spaced teeth or cogs 25 that are adapted to cooperate with indexing means in the camera and sequentially rotate the flashcube 10 through 90° as the pictures are taken. A suitable contact-support means such as a circular collar 26 that is concentric with the spindle 24 also projects outwardly from the bottom face of the base member 22. The collar 26 is composed of electrically non-conductive material and preferably comprises an integral molded part of the base member. Vent holes 27 are provided in the base member 22 to permit air to circulate through the unit 10 and to allow any gases produced when the lamps 16 are flashed to escape.

As is illustrated in FIG. 2, the reflectors 14 are formed from a thin sheet of material, such as a suitable reflectorized plastic, that is folded into a rectangular sleeve and held in operative relationship with the flashlamps 16 by the container 12 and base member 22. The various components are fabricated and assembled into an integral unit in accordance with the teachings of the aforesaid Anderson et al. patent and Netherlands patent application.

The present invention is directed to an improved base and contact structure for the flashcube and these will now be described.

As will be noted in FIG. 2, each of the flashlamps 16 is provided with a press seal 19 at its lower end through which a pair of dual-strand wire conductors 20 extend. These conductors are formed by bending each of the single lead wires into closed U-shaped loops prior to the press-sealing operation and then embedding the retroverted ends of the wires in the seal when the latter is formed. Since the leads are fabricated from nickel plated "dumet" of the same diameter (approximately 16 mils or 0.4 mm.) employed in the prior art flashcubes, the resulting dual-strand conductors 20 are quite stiff. The strands of the individual conductors 20 are disposed in contiguous side-by-side relationship as shown.

The improved base and contact structure is provided in accordance with this invention by threading the dual-strand wire conductors 20 through preselected ones of a series of apertures 28 that are circumferentially spaced around the inner periphery or foot of the collar 26 (see FIGS. 2-4). The protruding ends of the conductors 20 are then bent over and around the rim of the collar 26, while the flashlamps 16 are held against the inner surface of the base member 22, in a manner such that the ends of the conductors concurrently swing through tapered elongated channels such as slots 30 provided around the periphery of the base member 22.

As shown more particularly in FIG. 3, the slots 30 extend radially inward from the sides of the base member 22 and are aligned with the series of apertures 28. The slots 30 are thus disposed in "sunburst" array around the outer periphery of the collar 26 and are grouped in pairs that straddle an imaginary pair of lines which quadrisection the base member 22 and divide it into four equal parts. The apertures 28 and slots 30 are located on opposite sides of the collar 26, as shown.

As is illustrated most clearly in FIG. 4, each of the slots 30 are tapered toward the inner face of the base member 22 and the collar 26 so that the slot depth progressively increases as one proceeds along a line extending from the mouths to the inner ends of the slots. Added slot depth is preferably achieved by forming a plurality of protruding bosses 31 on the inner face of the base member 22. In addition, the inner ends of each of the slots 30 preferably merge with a series of openings 32 (see FIG. 3) that extend through the base member 22 and thus provide means for accommodating conductors having a longer exposed length than those here illustrated. The ends of the conductors 20 are recessed within the deep ends of the slots 30 (see FIGS. 1 and 2) and cannot

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accidentally become entangled and possibly bent out of shape while the flashcubes are being handled in the factory or carried about in a photographer's pocket or case. The stiffness of the conductors 20 is such that the flashlamps 16 are securely locked in an upright position with the press seals 19 seated in abutting relation with the inner face of the base member 22, as shown in FIG. 4.

It will be appreciated from the foregoing that the objects of the invention have been achieved in that an improved base and contact construction for a disposable flashcube has been provided which not only facilitates the assembly of the cube but effectively doubles the contact surface area per lamp and securely locks the lamps in place on the base member.

While a preferred embodiment has been illustrated and described, it will be appreciated that various modifications in both the configuration and arrangement of the various elements can be made without departing from the spirit and scope of the invention. For example, the dual-strand wire conductors can be flattened to provide contacts having an even greater surface area. It will also be apparent that the "dual-contact" and "recess-slot" concepts of this invention can be used with the same advantages as part of the permanent wiring and circuiting in flashcube adaptors that are designed to receive and be reloaded with standard size AG-1 type flashlamps.

We claim as our invention:

1. In a photographic flashlamp unit having a plurality of photoflash lamps assembled in operative relationship with a corresponding number of reflectors within a light-transmitting container, each of said lamps having a seal at one end and said container having a base member of insulating material disposed at its open end and fastened to the container, the improvement comprising the combination of;

a pair of lead wires extending through the seal at the end of each of the respective lamps, the exposed portions of each of said lead wires being bent into a closed U-shaped loop and the retroverted ends of the respective wires being embedded in the respective lamp seals so that said lead wires form dual-strand conductors which have a U-bend at their free ends and consist of paired strands of wire arranged in contiguous side-by-side relation,

contact-support means projecting from the outwardly-disposed face of said base member,

peripheral portions of said base member being conformed to provide a series of paired circumferentially-spaced elongated channels in the outer face of said base member that extend radially inward from the periphery of the base member to said contact-support means and are spaced to receive the free ends of the respective dual-strand wire conductors,

said base member having a series of circumferentially-spaced apertures therethrough that are aligned with said channels and located adjacent to and inwardly of said contact-support means,

said dual-strand wire conductors extending through preselected ones of said apertures, around the protruding contact-support means and into the proximate ends of the oppositely-disposed channels so that the free ends of said dual-strand conductors are recessed within their associated channels and a pair of exposed dual contacts are thereby provided for each of said lamps,

said dual-strand wire conductors being in tight-fitting engagement with said contact-support means and holding the respective lamps in upright position with the sealed ends thereof in abutting relation with the inner face of said base member.

2. The improvement set forth in claim 1 wherein said channels are tapered toward said contact-support means and the inner face of said base member in a manner such that the channel depth progressively increases along

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a line extending from the mouths of the respective channels toward said contact-support means.

3. The improvement set forth in claim 2 wherein; said contact-support means comprises a collar of circular configuration,

said channels are of slot-like configuration and merge with openings in the base member that are located at the inwardly-disposed ends of the channels and on the side of said collar opposite said series of apertures, and

the strands comprising the respective dual-strand wire conductors are disposed in contiguous side-by-side relationship and tightly wrapped around the rim of said collar.

4. The improvement set forth in claim 2 wherein; said contact-support means comprises a collar of circular configuration that is composed of the same material as and is integral with said base member, said series of apertures are located at the foot of said collar, and

the free ends of the dual-strand wire conductors are disposed in the inwardly-disposed ends of the respective channels and recessed there within.

5. The improvement set forth in claim 4 wherein; said flashlamp unit is of generally cubical configura-

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tion and contains four flashlamps that are arranged so that a lamp is disposed opposite each of the side walls of the container,

said base member is generally square shaped, said circular collar is centrally disposed relative to and spaced inwardly from the edges of said base member, and

said channels comprise rectangular slots that are symmetrically arranged in sunburst array around the outer periphery of said collar and are grouped in pairs that straddle an imaginary pair of lines which quadrisect the base member.

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