

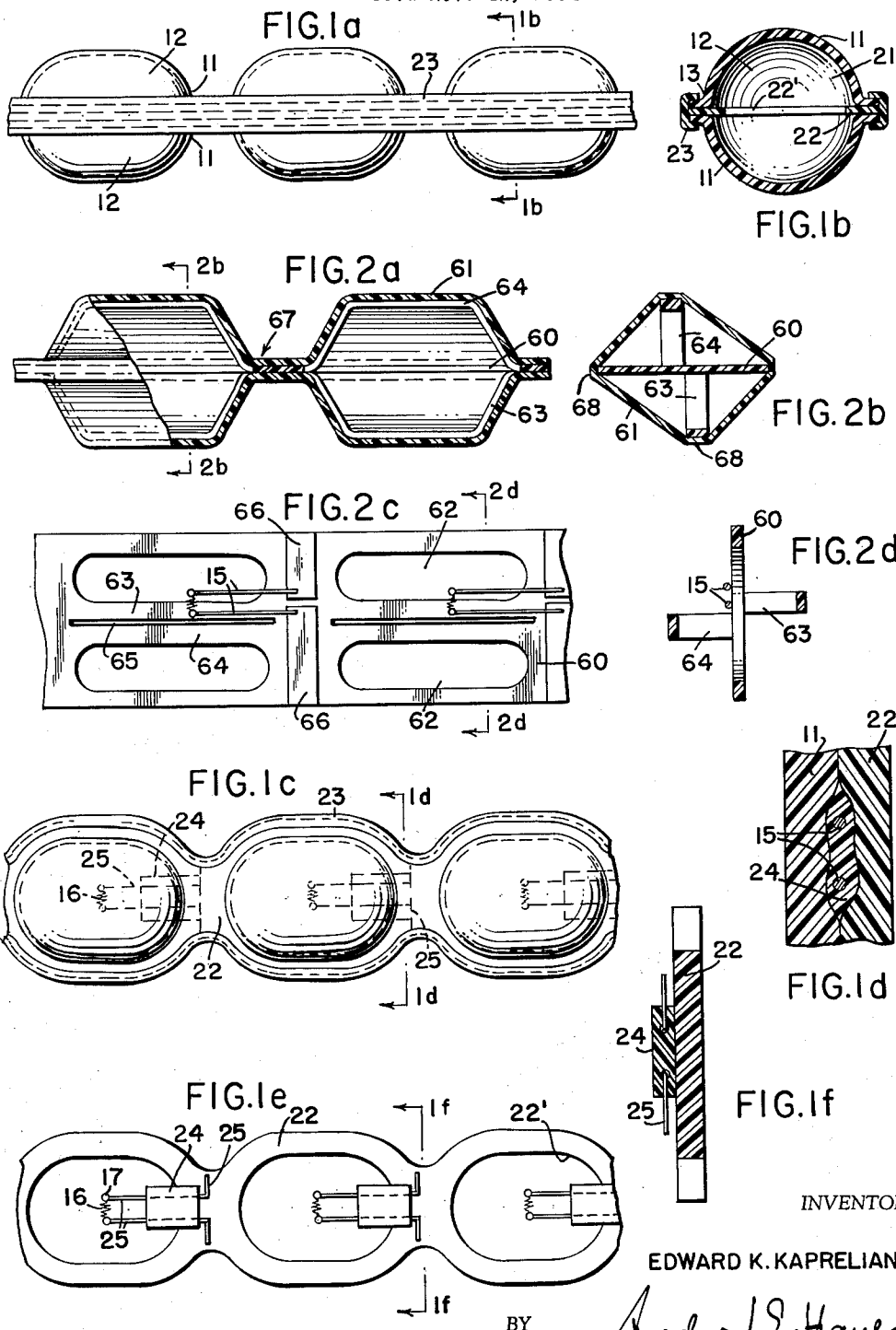
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MULTIPLE PHOTOFLASH LAMP ARRANGEMENT

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MULTIPLE PHOTOFLASH LAMP ARRANGEMENT

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This invention relates to a multiple photoflash lamp or bulb arrangement for photographic use.

Photoflash lamps as now in general use are constructed in a manner similar to incandescent light bulbs, that is, they have a glass envelope joined to a base through which the electric connections are made and which is insertable in a suitable lamp socket. The envelope is usually filled with combustible thin metal wire or shredded foil in an oxygen atmosphere at slightly less than atmospheric pressure, ignition being effected by means of a filament wire and associated fulminating beads. The manufacture of flash lamps as heretofore known, involves steps such as blowing of the glass envelope, sealing of lead wires to a press strip and glass stem, filling the envelope with combustible wire or foil, sealing the stem to the envelope, evacuating the envelope and filling it with oxygen at reduced pressure, sealing the envelope, attaching the base and soldering the lead wires to the base. Many of these operations are difficult and costly, due to the high temperatures required to melt the glass of the envelope and the stem and for other reasons of manufacture. Furthermore, the manufacture of conventional flash lamps does not lend itself as well as desired to high speed mass production methods because each envelope must be blown separately, each stem must be formed separately, the envelope and the stem must be handled again for the sealing operation. Evacuation and filling of the envelopes, attaching and cementing of the bases and soldering of the connections all involve separate steps generally carried out in a series of successive stations on several different special machines and devices. As a result, conventional flash lamps are comparatively expensive.

The design of conventional flash lamps and conventional methods of manufacturing same are inherently uneconomical. While a light bulb is intended for long time service, which justifies an elaborate and comparatively expensive construction, a photoflash lamp is used only once and for a few thousandths of a second. Obviously, any electrical connection capable of making contact for such single, extremely short use is adequate for the purpose.

One of the objects of the invention is to provide a novel and greatly simplified photoflash lamp design which lends itself to high speed mass production and which can be produced appreciably less expensively than conventional photoflash lamps designed similar to incandescent light bulbs.

Another object of the invention is to provide a novel and improved flash lamp design which occupies less space than conventional flash lamps having a base similar to a light bulb and which simplifies loading of a flash gun with a flash lamp thereby permitting to take a series of flash pictures in more rapid succession than is possible with conventional flash lamps. This is an important advantage to a photographer, particularly to a news photographer. The reduction of the overall dimensions of a flash lamp according to the invention in comparison with a conventional flash lamp of similar light output permits

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the photographer to carry a greater number of flash lamps within a container of given size and also reduces the weight of the flash lamps, both of which facts are of great value to the photographer.

Still another object of the invention is to provide novel and improved flash lamps in form of a string of easily severable envelopes or pellets with simplified terminal connections.

A further object of the invention is to provide a novel and improved flash lamp design which permits making part of or the entire envelope of a material which facilitates high speed manufacture of the envelope proper and other components of flash lamps.

Another object of the invention, allied with the preceding ones, is to provide a novel method of manufacturing photoflash lamps, by means of which the need for costly high temperatures inherent in conventional methods of manufacture is reduced or even entirely eliminated.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims forming part of the application.

In the accompanying drawings several preferred embodiments of the invention are shown by way of illustration and not by way of limitation.

In the drawings:

Fig. 1a is a fragmentary elevational view of a string of photo flash lamps according to the invention.

Fig. 1b is a section taken on line 1b—1b of Fig. 1a.

Fig. 1c is a plan view of Fig. 1a.

Fig. 1d is a fragmentary section taken on line 1d—1d of Fig. 1c on an enlarged scale.

Fig. 1e is a fragmentary plan view of the gasket strip used in the lamp string of Fig. 1a.

Fig. 1f is a section taken on line 1f—1f of Fig. 1e on an enlarged scale.

Fig. 2a is a fragmentary elevational sectional view of another modification of a photo flash lamp string employing a skeleton for supporting the covering of the lamp envelopes.

Fig. 2b is a section taken on line 2b—2b of Fig. 2a.

Fig. 2c is a plan view of the skeleton shown in Figs. 2a and 2b.

Fig. 2d is a section taken on line 2d—2d of Fig. 2c.

Referring first to Figs. 1a through 1d in detail, the string of lamps according to these figures is formed by two similar strips 11 joined as shown. One or preferably both strips are made of a transparent or suitably translucent plastic which is sufficiently impermeable to oxygen or can be so rendered by suitable treatment. Types of plastic which have been found suitable for the purpose are cellulose acetate, mylar, methyl methacrylate and various fluorinated hydrocarbons.

Each of the strips is formed with a plurality of longitudinally spaced bulbous portions 12. The bulbous portions of the two strips complement each other to form the closed envelopes of the flash lamps. The strips may be visualized as continuous strips so that the string of flash lamps may contain any desired number of envelopes.

As can best be seen in Fig. 1c, the bulbous portions 12 leave a strip margin which form flanges 13 encircling each of the envelopes.

A gasket strip 22 is interposed between strips 11. This gasket strip which is preferably also made of plastic, facilitates positioning and retention of the lead-in wires during manufacture. As can best be seen in Fig. 1e, the gasket strip has a plurality of longitudinally spaced openings 22' produced by a punching or other suitable operation and corresponding in shape and disposition to the location of bulbous portions 12.

A pair of lead-in wires 25 is embedded in and electrically insulated one from the other by a block or piece of

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plastic material 24. Each block or piece 24 containing wires 25 is fastened to the gasket strip 22, for instance by heat sealing, adjacent to each opening 22' as can best be seen in Fig. 1e. The wire ends protruding from the insulation material at opposite sides thereof serve to support a filament 16 and an ignition charge 17 and to form contact connections corresponding to the contact connections 18 previously described.

The envelope strips and the gasket strip are joined by solvents or heat sealing after filling the bulbous portions 12 with combustible material and oxygen. The width of the gasket strip is preferably such that it overlaps the marginal flanges 13 of strips 11. This permits reinforcement of the sealing between strips 11 and the gasket strip by forming the protruding margin of the gasket strip into a flange 23. The forming of sealing flange 23 can be effected by any means suitable for the purpose such as forming rollers. The application of the respective strip 11 to the side of the gasket bearing terminal pieces 24—in the drawing the upper strip—by heat and pressure causes the plastic insulation material of the pieces 24 to flow whereby the insulation material of pieces 24 is thoroughly bonded to the plastic material of gasket 22 and the respective strip 11 as is indicated in Fig. 1d.

Figs. 2a through 2d show a string of photo flash lamps, the envelopes of which each include a stiff skeleton covered with a relatively flexible and even somewhat loose skin or covering of a thin plastic material relatively impermeable to oxygen.

As shown in Fig. 2c, the skeletons are formed by providing in a plastic strip cut outs 62 and slots 65. This results in two strip parts 63 and 64 attached to or integral with a base strip 60. The respective strip parts are bent outwardly as shown in Figs. 2b and 2d to provide the frame for supporting the envelope cover 61. Lead-in wires 15 are connected to contact members 66 provided between each envelope. The contact members may comprise foil strips, evaporated metal, sprayed metal or the like. The envelopes are heat sealed to the skeleton strip at the areas 67 between each two envelopes and may be additionally sealed to the skeleton strips at the edges 68 as shown in Fig. 2b.

While the invention has been described in detail with respect to certain now preferred examples and embodiments of the invention it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A multiple photoflash arrangement comprising two strips of gas impermeable transparent material, each of

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said strips including longitudinally spaced complementary bulbous portions, a gasket strip coextensive in length with said strips and including longitudinally spaced openings corresponding in spacing and outline to the outlines of said bulbous portions at the open side thereof, said two strips and said gasket strip being sealed together in superimposed relationship with the open side of the bulbous portions facing each other and the gasket strip sandwiched between said two strips to form a plurality of sealed individual envelopes joined by easily severable superimposed strip portions between each two envelopes, combustible light producing material disposed in each of said envelopes, electrically actuable ignition means for igniting said material mounted within each envelope upon the gasket strip portion therein, and a contact means for each of said envelopes, each of said contact means including two wires outwardly protruding in the same direction from the respective ignition means through the respective envelope into the adjacent joining strip portions substantially parallel to the plane thereof, the protruding end portions of each pair of wires being bent within the strip material transversely of the length of the strips and protruding laterally therefrom on opposite longitudinal sides of the strips, said envelopes constituting a coherent strip of individually ignitable flash bulbs and the protruding wire ends forming two parallel longitudinal rows of contact terminals.

2. A photoflash arrangement according to claim 1 wherein said gasket strip protrudes along both longitudinal edges of said two strips and the protruding portions of the gasket strip are beaded over the respective adjacent longitudinal edge of said two strips including the bulbous portions.

3. A photoflash arrangement according to claim 1 wherein a substantially rigid skeleton is included in each of said envelopes, each of said skeletons supporting the bulbous strip portions forming the respective envelope.

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