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REFLECTORS FOR PHOTOGRAPH APPARATUS AND THE LIKE

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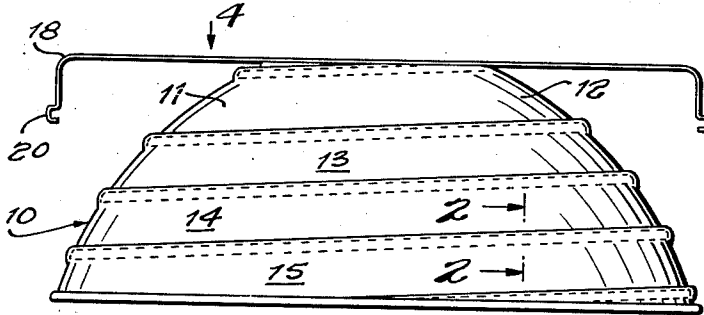


FIG. 1.

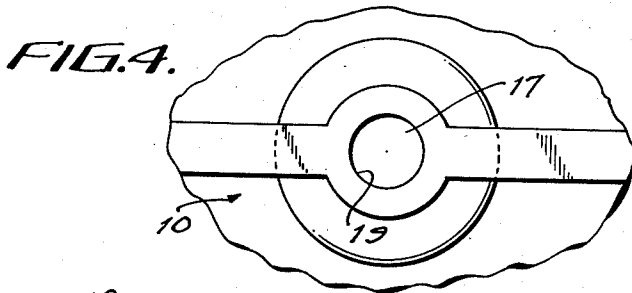


FIG. 4.

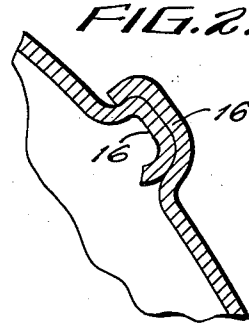


FIG. 2.



FIG. 3.

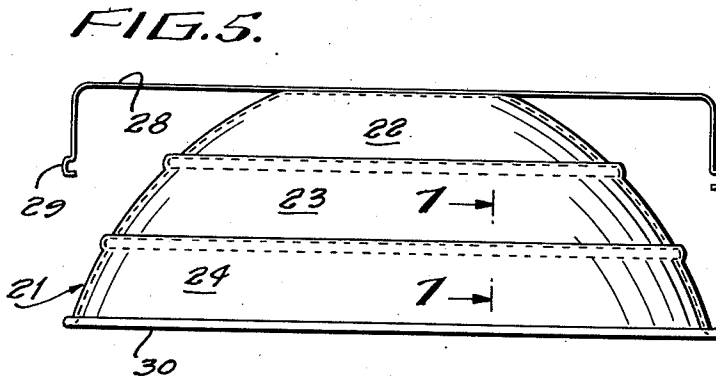


FIG. 5.

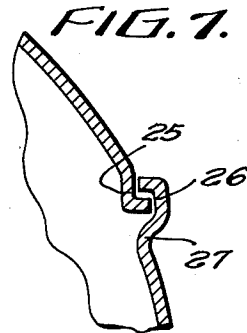


FIG. 7.

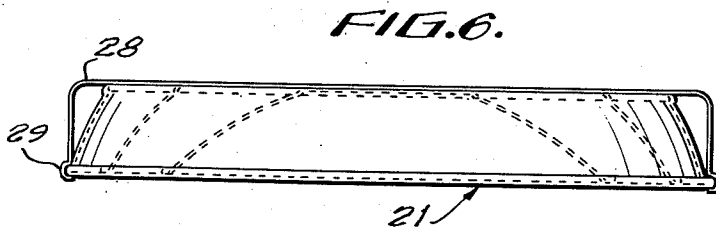


FIG. 6.

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REFLECTORS FOR PHOTOGRAPH APPARATUS AND THE LIKE

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4 Claims. (Cl. 240—103)

The present invention relates to reflectors for photographic apparatus and the like, such as, for example, reflectors which are adapted to be connected to flash guns of cameras.

One of the objects of the present invention is to provide a reflector which is collapsible and expandable.

Another object of the present invention is to provide a reflector which is collapsible and expandable and which is rigidly held in its expanded position.

A further object of the present invention is to provide a reflector which is collapsible and expandable and which provides a substantially continuous reflecting surface when the reflector is in its expanded position.

Yet another object of the present invention is to provide a means for releasably holding a collapsible and expandable reflector in its collapsed position.

An additional object of the present invention is to provide a reflector which is collapsible and expandable and which is capable of automatically moving from its collapsed to its expanded position.

A still further object of the present invention is to provide a reflector which is collapsible and expandable and which is made in one piece.

With the above objects in view, the present invention mainly consists of a collapsible reflector, for photographic equipment and the like, including a first substantially circular reflector portion made of a springy material and having a free edge portion extending along the length of said first reflector portion and being bent transversely to the length thereof, and including a second substantially circular reflector portion also made of a springy material and having a free edge portion extending along the length of said second reflector portion and being bent transversely to the length thereof, the said free edge portions of the first and second reflector portions being of substantially the same length and the first and second reflector portions being movable with respect to each other from a collapsed position where the reflector portions are located at substantially the same level to an expanded position where the free edge portions of the first and second reflector portions are in interlocking engagement with each other to rigidly hold the reflector portions in the expanded position thereof and to produce a substantially continuous reflecting surface.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a side elevational view of one type of reflector constructed in accordance with the present invention and shown in its expanded position;

Fig. 2 is a fragmentary sectional view taken along line 2—2 of Fig. 1 in the direction of the arrows;

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Fig. 3 is a side view of the reflector of Fig. 1 in its collapsed position;

Fig. 4 is a fragmentary rear view of the reflector of Fig. 1 taken in the direction of arrow 4 of Fig. 1;

Fig. 5 is a side elevational view of another type of reflector constructed in accordance with the present invention and shown in its expanded position;

Fig. 6 is a side elevational view of the reflector of Fig. 5 in its collapsed position; and

Fig. 7 is a fragmentary sectional view taken along the line 7—7 of Fig. 5 in the direction of the arrows.

Referring now to the drawings, there is shown in Fig. 1 a reflector 10 made from a single strip 11 of springy material, such as a springy metal or the like.

The successive convolutions 12, 13, 14 and 15 of reflector 10 are of a gradually increasing size and have their edge portions in interlocking engagement with each other when the reflector 10 is in the expanded position of Fig. 1. In order to produce this interlocking engagement, the opposite side edge portions of the strip 11 are bent transversely to the length of the strip, as shown in Fig. 2, to form grooves 16 in these edge portions of the strip 11. As is apparent from Fig. 2, these grooves 16 face in the same direction so as to be in nesting relationship when the reflector is in the expanded position of Fig. 1 to produce the interlocking engagement between the convolutions 12—15. The outer rim of the largest convolution 15 is formed as an endless rim. Due to the springy nature of the material of strip 11, the convolutions 12—15 will snap with a clicking sound into and out of interlocking engagement with each other.

The elongated strip 11 may have the groove 16 formed in the opposite side edge portions thereof in a very simple way by continuously moving the strip through a properly shaped set of rollers. Then the strip is spirally wound and has the opposite ends of its largest convolution connected, as by welding or the like, to form the outer rim of convolution 15. The reflector 10 is shown in its collapsed position in Fig. 3 and the material of strip 11 is carefully chosen so as to have a resilient force sufficient to automatically move the convolutions 12—15 into the expanded position of Fig. 1 when released from the collapsed position of Fig. 3.

The smallest convolution 12 is formed with an opening 17 (Fig. 4) for attaching the reflector to the flash gun of a camera, for example, and a releasable holding means in the form of an elongated, substantially U-shaped strip 18 of spring metal or the like is formed intermediate its ends with an opening 19 aligned with opening 17. This strip 18 is fixed to convolution 12 on the outside thereof and about the opening 17 thereof, and the opposite free ends 20 of strip 18 are hook-shaped to engage the outer rim of convolution 15, as is shown in Fig. 3, the strip 18 having a resilient force greater than that of strip 11 so as to be capable of holding the latter in the collapsed position of Fig. 3. It is only necessary for the operator to move the hook-shaped ends 20 from the outer rim of convolution 15 in order for the strip 11 to automatically move into the expanded position of Fig. 1.

A different embodiment of the present invention is illustrated in Figs. 5—7. The reflector 21 is shown in its expanded position in Fig. 5 and in its collapsed condition in Fig. 6, this reflector 21 comprising three circular parts 22, 23 and 24 which are of a gradually increasing size and which have their edges overlapping and in interlocking engagement with each other when the reflector is in the expanded position of Fig. 5. The material of the reflector parts 22, 23 and 24 is a springy metal, or the like, and the interlocking edge portions of these parts are bent transversely to the length thereof, as is clearly shown on an enlarged scale in Fig. 7. As is apparent from Fig. 7, the cooperating edge portions of the

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adjacent parts of the reflector 21 are bent transversely of their length so as to form grooves 25 and 26 which face in opposite directions so that the interlocking edge portions are in hooking engagement with each other when the reflector is in the position of Fig. 5. As may be seen from Fig. 7, one of each pair of cooperating reflector parts includes a bend portion 27 which forms one wall of groove 26 and which, due to the springy material of the reflector parts, snaps over the edge of the cooperating reflector part when these parts are moved to and from their expanded position.

The reflector part 22 is formed with an opening of exactly the same size as opening 17 of convolution 12 of the reflector 10, so that the reflector of Figs. 5-7 may be connected to a flash gun, or the like, in exactly the same way as the reflector of Figs. 1-4, and a resilient, substantially U-shaped strip of springy metal 28, identical with the strip 18, is fixed to the reflector part 22 in the same way that strip 18 is fixed to convolution 12. The opposite hook-shaped end portions 29 of the strip 18 resiliently engage the rim 30 of reflector part 24 to hold the reflector 21 in the collapsed position of Fig. 6. The operator need only move the hook-shaped ends 29 of strip 28 away from rim 30 to free the reflector parts so that they can be moved into the expanded position of Fig. 5.

It is believed to be evident from the above description that the two reflector embodiments described above are not only of an exceedingly simple construction, but also are quite rigid in the expanded position of the reflector, due to the resilient material of the reflector and the interlocking engagement of its sections, and also in its expanded position either of the above-described reflector embodiments provides a substantially continuous reflecting surface.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of reflectors for photographic apparatus and the like differing from the types described above.

While the invention has been illustrated and described as embodied in collapsible and expandable reflectors for photograph apparatus and the like, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can be applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

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

1. A one-piece collapsible reflector, for photographic apparatus and the like, consisting of a spirally wound strip of springy material having the successive convolutions thereof in engagement with each other when the reflector is in its expanded position, and said successive convolutions gradually changing in size from one end of the reflector to the opposite end thereof, said strip having its opposite side edge portions bent transversely to the length of said strip so that said convolutions are in interlocking engagement with each other when the reflector is in said expanded position thereof.

2. A reflector, for photographic apparatus and the

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like, comprising, in combination, a single spirally wound strip of material having the successive convolutions thereof in engagement with each other when the reflector is in its expanded position, and said successive convolutions gradually changing in size from one end of the reflector to the opposite end thereof, said convolutions being located at substantially the same level when said reflector is in its collapsed position and said strip being made of a springy material having a resiliency great enough to automatically move said convolutions from said collapsed position to said expanded position; and holding means releasably engaging said ends of the reflector to hold the same against the action of said springy strip in the collapsed position thereof.

3. A reflector, for photographic apparatus and the like, comprising, in combination, a single spirally wound strip of material having the successive convolutions thereof in engagement with each other when the reflector is in its expanded position, and said successive convolutions gradually changing in size from one end of the reflector to the opposite end thereof, said convolutions being located at substantially the same level when said reflector is in its collapsed position and said strip being made of a springy material having a resiliency great enough to automatically move said convolutions from said collapsed position to said expanded position; and holding means releasably engaging said ends of the reflector to hold the same against the action of said springy strip in the collapsed position thereof, said holding means being in the form of a substantially U-shaped length of springy material having a resilient force greater than that of said strip and having hook-shaped free end portions engaging one of said ends of said reflector.

4. A reflector, for photographic apparatus and the like, comprising, in combination, a single spirally wound strip of material having the successive convolutions thereof in engagement with each other when the reflector is in its expanded position, and said successive convolutions gradually changing in size from one end of the reflector to the opposite end thereof, said convolutions being located at substantially the same level when said reflector is in its collapsed position and said strip being made of a springy material having a resiliency great enough to automatically move said convolutions from said collapsed position to said expanded position; and holding means releasably engaging said ends of the reflector to hold the same against the action of said springy strip in the collapsed position thereof, said holding means being in the form of a substantially U-shaped length of springy material having a resilient force greater than that of said strip and having hook-shaped free end portions engaging the rim of the larger of said ends of said reflector, said length of springy material being fixed intermediate the ends thereof to the smaller of said ends of said reflector.

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