Jan. 5, 1937. C. W. THOMPSON 2,066,548

KALEIDOSCOPE

Filed Feb. 9, 1934 2 Sheets-Sheet 1

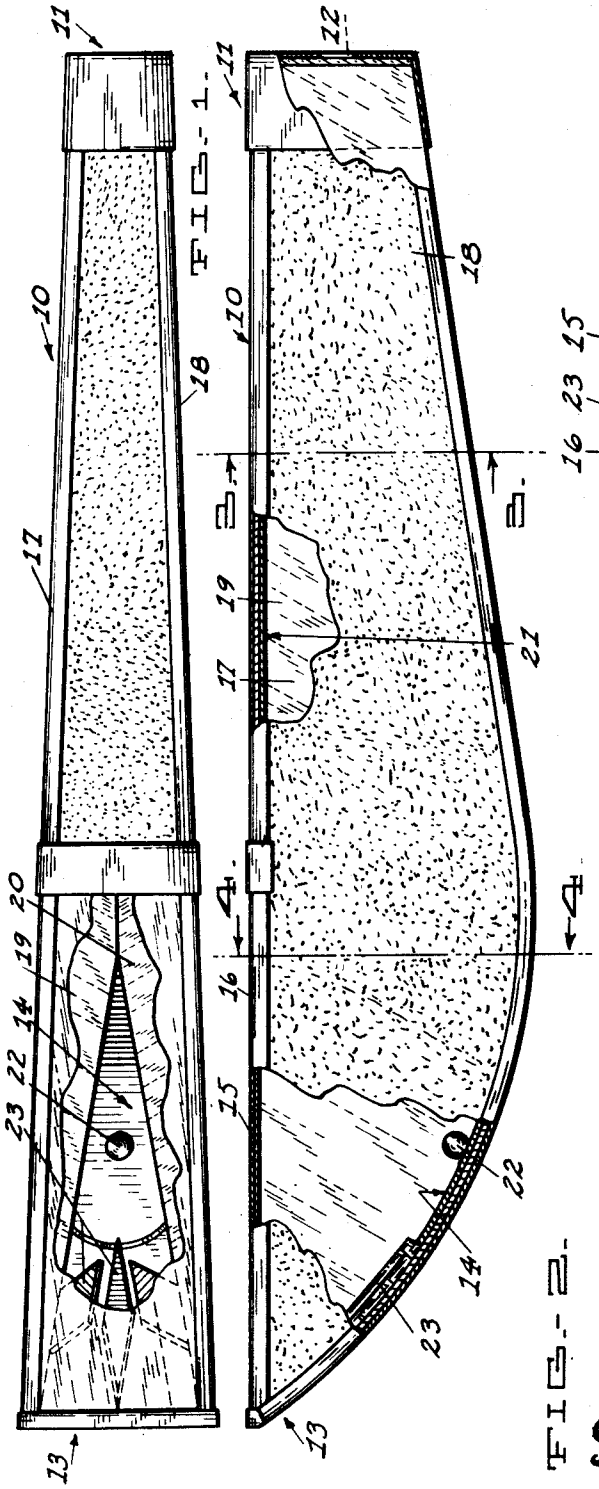


FIG. 1.

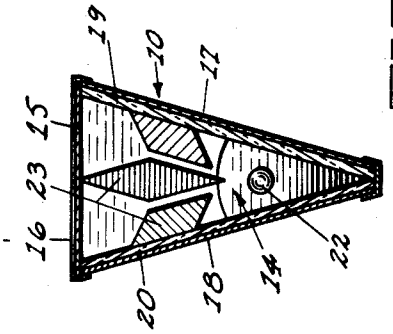


FIG. 4.

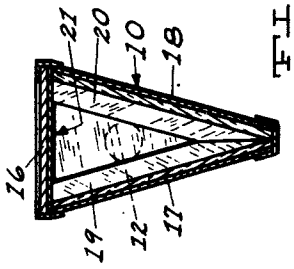


FIG. 3.

FIG. 2.

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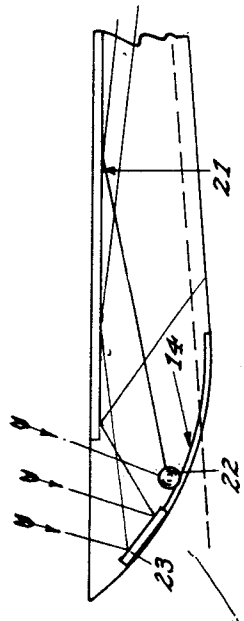


FIG. 4.

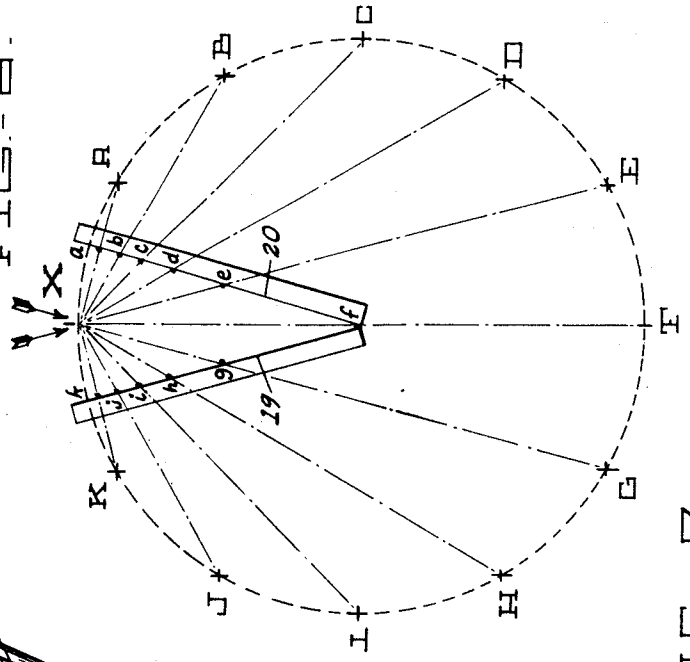


FIG. 7.

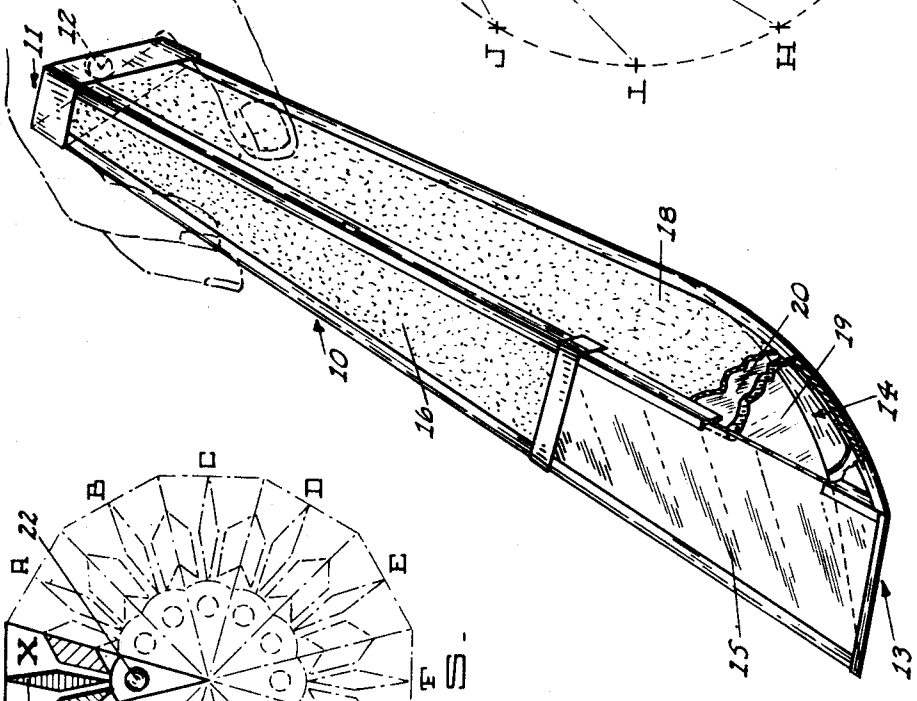


FIG. 6.

FIG. 5.

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UNITED STATES PATENT OFFICE

2,066,548

KALEIDOSCOPE

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Application February 9, 1934, Serial No. 710,556

11 Claims. (Cl. 88—15)

The present invention relates generally to optical devices, and has particular reference to optical toys commonly known as kaleidoscopes.

The principal object of the present invention is to provide a kaleidoscope of improved character in which the reflected figures are most perfect in symmetrical design and are caused to produce beautiful effects in stereoscopic relief not possible in the usual kaleidoscope.

Another object of the invention is the provision of a kaleidoscope of improved design, and in which the reflecting elements of the back reflector are so arranged in cooperative relation that the aforesaid effects may be effectually produced in bold relief.

A further object of the invention is to produce an improved kaleidoscope in which vari-colored objects of foil or the like, are utilized to produce the varied designs in the most pleasing effects to the eye of the observer.

An additional object is that of providing a kaleidoscope which is extremely simple in construction and design, and which may be produced very cheaply in quantities.

Other objects and advantages of the invention will be apparent with reference to the subjoined specification and the accompanying two sheets of drawings in which:—

Figure 1 is a top plan view of the improved kaleidoscope showing the general configuration of the casing;

Figure 2 is a side elevation of the same with portions broken away to disclose the relative positioning of the reflectors of the device;

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 2 and showing the V-shaped formation of the casing;

Figure 4 is a transverse sectional view taken on the line 4—4 of Figure 2 and showing the general configuration of the end reflecting section of the device on which the designs are formed;

Figure 5 is an enlarged view illustrating one form of a design that may be produced by the device and showing its segmental formation as it appears to the eye of the observer;

Figure 6 is a perspective view illustrating the general configuration of the device and especially the curviform reflecting segment in the reflecting end thereof;

Figure 7 is a diagrammatic view illustrating the light reflecting and re-reflecting elements arranged in the sides of the case and the method of duplicating the segmental formation of the elements to form the completed design; and

Figure 8 is a diagrammatic view illustrating the light rays entering the window section and being reflected by the bowed reflector to the top reflector, and re-reflected therefrom to the eye of the observer, thereby causing the design to be brought out in relief.

Kaleidoscopes constructed in the usual manner, produce designs of an indifferent character and said designs do not stand out in relief, nor do they have the multi-colored hues or symmetrical multi-colored effect produced by applicant's kaleidoscope for the reason that applicant utilizes a bowed end reflector in combination with other reflectors so arranged as to produce a depth or relief to the designs, not possible of attainment with planar reflecting mediums commonly used for this purpose.

In detail, the device of the present invention consists of an elongated casing 10 of V-shaped configuration in cross section gradually tapering to the aperture end 11 in which the aperture 12 is centered.

The larger end 13 of the casing is of outwardly bowed shape and is provided on its concave face with a reflector 14, said reflector being in the form of a segment, as clearly disclosed in Figures 1, 4 and 6.

A window 15 is arranged in the top side 16 of the casing directly above the reflector 14 and the angularly disposed side sections 17 and 18 are provided with reflectors 19 and 20, as clearly shown in Figures 1, 3, and 4.

The top section 16 of the casing is also provided with a reflector 21 arranged on the underside thereof and extending from the window 15 toward the aperture 12 of the device.

The elements which form the design consist preferably of several pieces of multi-colored tin foil in the shape of balls 22 and various other flat and rolled multi-colored objects or segments 23 of any suitable material loosely arranged in the casing and normally resting upon the reflector segment 14, as clearly disclosed in Figures 1, 2 and 4.

Referring particularly to Figure 5 in which a diagrammatic design has been shown, it will be observed that one segment X has been shown in full lines and this segment X represents the reflector segment 14 or the actual disclosure of the segment 14 to the eye of the observer when looking through the aperture 12 with the eye at some distance from the aperture; but as the eye is brought in close proximity to said aperture the complete design is disclosed by the duplication of the segment X into eleven similar

segments A to K, as shown in dot-and-dash lines in said figure, and each time the casing is agitated by the observer the design is completely changed both as to color effects and form.

Referring to Figures 7 and 8 and especially to Figure 8, it will be observed that the light rays enter the window 15 and strike the objects 22 and 23 and also the reflector 14 from whence they are reflected to the reflector 21 and reflected thereby to the aperture 12 and to the reflector elements 19 and 20 near the aperture end 11.

In this manner the multi-colored objects are built up and stand out in bold relief to the eye of the observer in beautiful designs ever changing as the casing is agitated, as disclosed in Figure 7.

The reflector elements 19 and 20 are arranged at 60 degree angles relative to each other, and certain of the light rays entering the window 15 impinge against the reflectors as indicated by the lower case letters *a, b, c, d, e, f, g, h, i, j,* and *k* and produce the illusionary effect of duplicating the additional eleven segments A to K inclusive to form the completed symmetrical and multi-colored designs of any desired character.

The designs created by the device are multitudinous in formation and due to the reflective qualities of the reflectors and the relative arrangement of same it is obvious that the designs created by the device are exceedingly beautiful, and whose configuration is symmetrical as to form and coloration, and also produces the relief effect and definition which is most desirous in a device of this character.

It will be observed that the elements 22 and 23 are each individually made up of various colors and combinations of the Newton spectrum, that is, each element is constituted of several color combinations whereby a different color combination is produced each time the device is agitated, which arrangement eliminates the colors or shades in whole, or in part, of those visible in the previous design. This being due to the fact that the reverse side of each element has different colors or shades of color than its opposite side.

I claim and desire to secure by Letters Patent of the United States the following:—

1. In a kaleidoscopic toy of the class described means for forming a symmetrical design embodying a casing having an outwardly bowed reflecting element in one end thereof, a plurality of multi-colored objects loosely arranged upon said reflecting element, and adapted to produce a segmental design of multi-colored hues thereon, side reflectors arranged in said casing and adapted to cause said segments to be reproduced in complete form, an aperture at the other end of said casing, and reflecting means for causing said design to appear in multi-colored relief through said aperture.

2. In a kaleidoscopic toy, means for forming and reproducing a symmetrical design embodying a casing substantially V shaped in cross section, and having an outwardly bowed reflecting end and an aperture at its opposite end, a reflector arranged in said bowed end and reflectors arranged in the sides and top section of said casing, multi-colored objects loosely arranged upon said bowed reflector and adapted to produce a multi-colored symmetrical design on said bowed reflector, and said top reflector cooperating to cause said design to produce a stereoscopic effect and said side reflectors cooperating to reproduce the completed design when viewed through said aperture.

3. Means for producing various multi-colored designs embodying a casing having an outwardly bowed end and a window contiguous thereto angularly disposed side sections and a top section all having reflective surfaces, an aperture arranged in one end of said casing, and a plurality of multi-colored objects arranged on said bowed end section whereby when said casing is tilted varying multi-colored designs are produced by said objects and appear to the observer in bold relief upon the bowed end section of said casing when viewed through said aperture.

4. A kaleidoscope comprising a substantially triangular casing, a light window in one of said sides at one end of said casing, reflecting elements on each side of said casing, a bowed end at said one end of said casing, design forming particles, and an apertured other end on said casing.

5. A kaleidoscope comprising a casing, a pair of reflectors extending longitudinally in said casing arranged in a V formation, an aperture at one end of said casing between said reflectors, and a bowed wall extending between said reflectors at the other end of said casing.

6. A kaleidoscope comprising a casing, a pair of reflectors extending longitudinally in said casing in a V formation, an eye aperture at one end of said casing, and an outwardly bowed wall at the other end of the casing between said reflectors having a reflector surface thereon.

7. A kaleidoscope comprising a casing, a pair of reflectors extending longitudinally in said casing in V formtion, an end wall having an aperture therein at one end of said casing, and a bowed wall extending from the adjoining edges of said reflectors at the vertex of the V formation to the outer spaced edges of the reflectors in said V formation, and a reflecting surface on said bowed wall.

8. A kaleidoscope including a casing, a pair of reflectors arranged in a V formation extending longitudinally in said casing, an end wall including an aperture at one end of said casing, and a bowed substantially triangular reflecting wall at the other end of said casing between said reflectors.

9. A kaleidoscope including a casing, a pair of reflectors arranged in a V formation extending longitudinally in said casing, an end wall including an aperture at one end of said casing, and a substantially triangular wall at the other end of said casing, between said reflectors, one vertex of said wall adjoining the vertex of said reflectors in V formation at a point substantially nearer the first named end wall than the side of said end wall opposite said vertex of said triangular wall.

10. A kaleidoscope including a casing, reflecting means in V formation extending longitudinally in said casing, said reflectors being substantially shorter at the vertex of said V formation than along the outer edges thereof, a substantially triangularly shaped wall secured adjacent the end of said reflector means at one end thereof, an end wall in said casing having an aperture therein, and a light opening in said casing adjacent said triangularly shaped wall.

11. A kaleidoscope comprising a substantially triangular casing, a light window in one of said sides at one end of said casing, reflecting elements on each side of said casing, a bowed end at one end of said casing, and design forming particles, comprising irregularly shaped figurative designs having a plurality of faces, said faces being radically different in color.

CHARLES W. THOMPSON.