

[54] **TOY HAND PROJECTOR**
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[51] Int. Cl. **G03b 21/00**
[58] Field of Search..... **353/21, 43, 122;**
40/63 A, 64 A, 106.1; 350/188

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[57] **ABSTRACT**

A hand held, toy projector has a battery operated light source and fixed lens system. A pistol type enclosure with a handle and trigger arrangement provides a realistic toy. The trigger is both an on-off switch for an enclosed, battery operated light source and a means to advance manually each picture frame.

7 Claims, 5 Drawing Figures

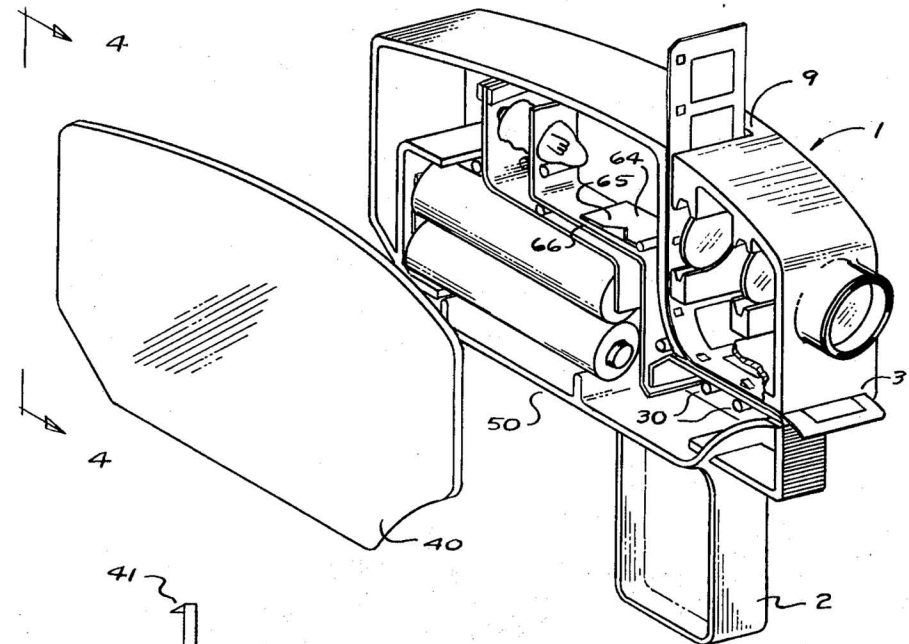
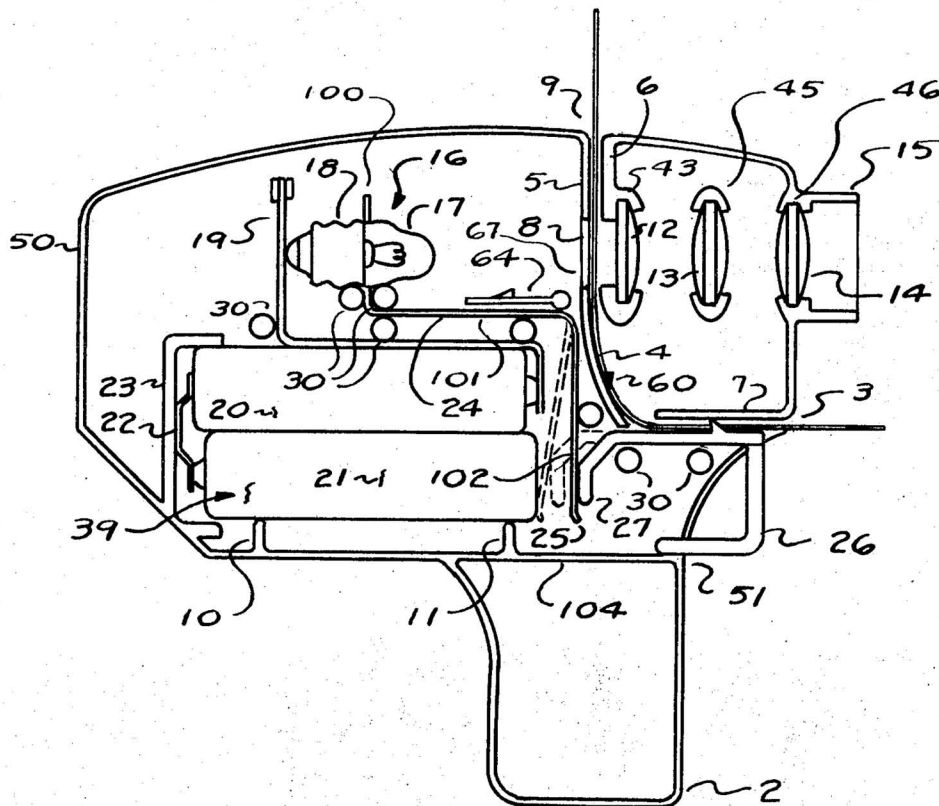


Fig-1

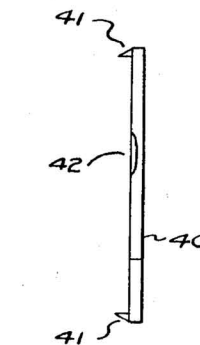


Fig-4

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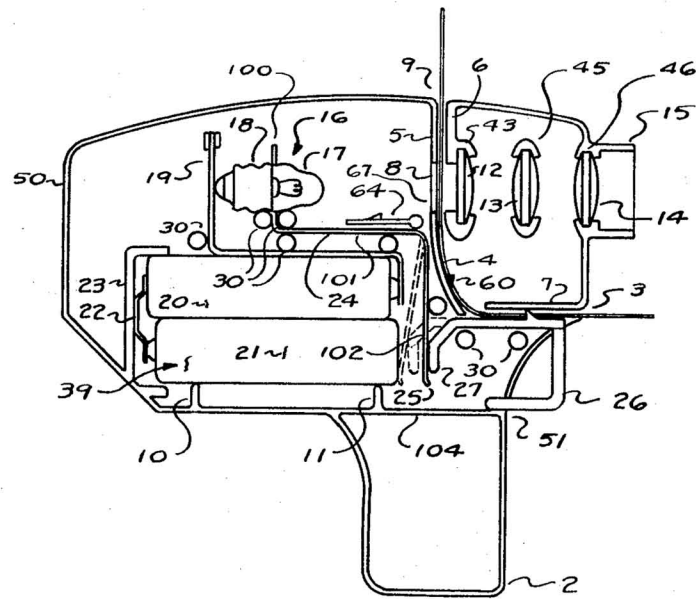


Fig - 2 -

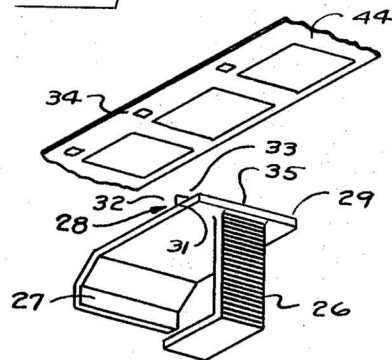


Fig - 3 -

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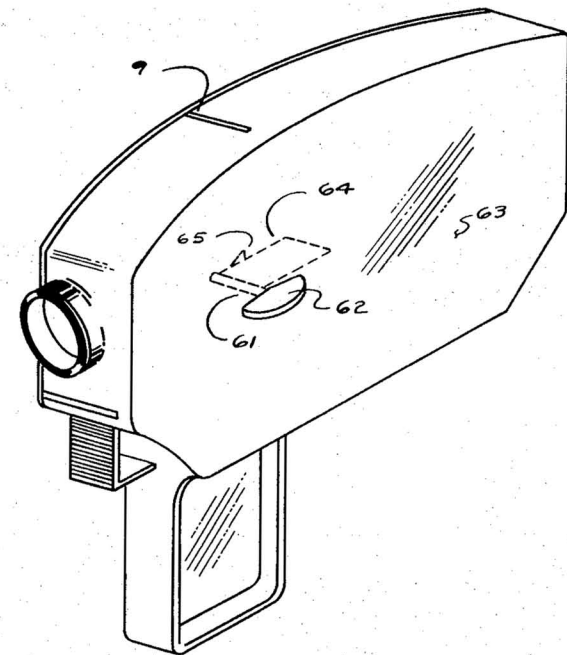


Fig - 5 -

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TOY HAND PROJECTOR

BACKGROUND OF THE INVENTION

This invention relates to toy projectors and particularly to the hand held, battery operated pistol type.

Commonly, toy manufacturers duplicate adult products in an attempt to find a receptive market. A projector has the connotation of being an adult item. They are particularly fascinating to children, both because of their adult association and because of the uses to which they may be put. Numerous attempts have been made to provide projectors or projector-like toys. While these prior art efforts work well for their specific purposes, they were either relatively expensive, both in product and manufacturing costs, or lacked realism in their operation.

One of the objects of this invention is to provide an easy to manufacture, simple to use, low cost toy projector.

Another object of this invention is to provide a toy projector that is held in the hands of the user.

Yet another object of this invention is to provide a toy projector with a simplified film feed and advance system.

Still another object of this invention is to provide a toy projector wherein manipulation of a manually operated switch for the light source also advances the film frame.

Other objects will become apparent to those skilled in the art in light of the following description and accompanying drawings.

SUMMARY OF THE INVENTION

In accordance with this invention generally stated, a toy projector is provided with a fixed focal length lens system. Film is advanced frame by frame by a pistol like trigger. The trigger also acts as an on-off switch for the light source.

In the preferred embodiment, the projector enclosure is a realistic pistol and grip arrangement. The picture is focused by physical movement toward or away from the area on which projection takes place. Dual action is provided by a self contained view screen. The toy is convertible to either projector or viewer function by a simple switch mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings, FIG. 1 is an exploded view in perspective of a hand held projector of this invention;

FIG. 2 is a view in side elevation of a hand held projector of this invention with the covering plate removed;

FIG. 3 is an enlarged detail view in perspective of the film advancing on-off switch trigger used in this invention;

FIG. 4 is a sectional view taken along the line 4-4 of FIG. 1; and

FIG. 5 is an enlarged view in perspective showing the switch mechanism for the projector of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1 for one illustrative embodiment of this invention, reference numeral 1 indicates an enclosure for a toy projector with a pistol grip 2 designed to be held in the hand. In the preferred embodi-

ment, pistol grip 2 is a skeleton construction. Enclosure 1 includes a hollow body 50 and a covering plate 40. Covering plate 40 may be snapped on and off body 50 by manual pressure. Covering plate 40 has a series of snap lugs 41 positioned along its perimeter, as is best seen in FIG. 4. Snap lugs 41 are integral with covering plate 40 and are designed either to engage body 50 in a demountable yet tight friction fit or to engage receptacles along the periphery of body 50. The preferred embodiment utilizes four snap lugs and a friction fit. A thumb depression 42 is provided to aid in releasing covering plate 40.

Several support blocks 30 are positioned about the internal cavity in the body 50, as may best be seen in FIG. 2. In the preferred embodiment, blocks 30 are made integral with body 50, and provide lateral structural support to body 50 and covering plate 40 in the closed position of those parts. Additionally, support blocks 30 serve other uses as described hereinafter.

A film feed and guide channel for the projector is formed along a series of film guides 4, 5, 6 and 7. The channel has an entrance opening 3 and an exit opening 9 in a top wall of body 50 marking the end of a channel defined by enclosure 1. Guides 4, 5, 6 and 7 are constructed as a part of enclosure 1 in the embodiment shown. However, they can be manufactured separately and attached by any convenient method, for example, by glue or other adhesive.

Film guides 4 and 5 also define the rear portion of a light aperture 8 through which light from a light source 16 impinges the film as it passes through the projector. Aperture 8 is sized so as to expose a single film frame to the light rays.

Film guide 6 performs several structural functions. It forms the forward wall of aperture 8 and is a part of a lens holder 43. Additional pairs of lens holders 45 and 46 are constructed as part of enclosure 1. In the embodiment shown, grooved blocks form the lens holder pairs. Their construction is conventional and any similar functional device will work well. Three lens elements 12, 13 and 14 are inserted into the lens holder pairs and are held in a tight friction fit. A small amount of adhesive or other glue-like substance may be applied to aid in fixing the lens elements, if desired.

As shown in FIG. 2, element 14 is the terminal image former of the fixed lens system and a simulated lens hood 15 surrounds its periphery.

Fixed within enclosure 1, and positioned so as to direct light through aperture 8, is light source 16 with a common flashlight bulb 17 and a bulb holder 18. The base area of holder 18 is electrically connected by a conductor 19 to the positive side of a battery supply 39. In the preferred embodiment, the battery supply 39 has two batteries 20 and 21 connected in series by a conductor 22. Batteries 20 and 21 are held in position by a U-shaped clasp 23 which is made integral with side and bottom walls of enclosure body 50. Vertical support beams 10 and 11 support the batteries in conjunction with clasp 23. The arrangement of the light source and battery supply is conventional and may vary according to overall size requirements or other design consideration.

A conductor 24, held and supported by a series of support blocks 30, completes the electrical circuit by connecting the negative side of battery supply 39 to the light source 16. Conductor 24 is unusual as it performs several different functions. As shown in FIG. 2, con-

ductor 24 is stepped in side elevation. An upper riser portion 100 is electrically connected to the light source 16. A horizontal step member 101 is parallel to the battery supply 39. A lower riser portion 102 has a natural bias so as to provide normally an open circuit between the light source and the battery supply. Lower riser 102 of stepped conductor 24 also has a turned lower edge 25 which abuts and partially engages a trigger 26.

Trigger 26 has three sides that are substantially rectangular and a fourth open ended, down-turned, conductor-engaging edge 27. An edge 29 on a top side 35 of trigger 26 acts on and in conjunction with enclosure 1 to prevent trigger 26 from leaving the confines of enclosure 1, once trigger 26 is placed in position. As can be seen in FIG. 3, a film hook 28 is attached to and is integral with trigger 26. It is positioned near forward edge 29 of the top rectangular trigger side and is triangular in side elevation. The sides of triangular hook 28 are designated as a base side 31, a film engaging side 32 and a film release side 33. Hook 28 is attached to trigger 26 along side 31, and is either constructed integral with trigger 26 or fabricated separately and attached by any convenient method, for example, glue.

Trigger 26 is slidably mounted within enclosure 1 and rides a lower track between enclosure opening 51 and a lower enclosure wall 104. Top rectangular trigger edge 35 rides a track defined by three of the support blocks 30, as can best be seen in FIG. 2. While support blocks 30 define the upper channel, they do not interfere with the movement of film hook 28.

Simple operation is provided. A film strip 44 is fed manually into entrance opening 3 until a sprocket opening 34 in the film is caught along and by the film engaging edge 32 of hook 28. To advance the film, trigger 26 is pulled rearwardly, as one would pull a trigger for a pistol. The distance of travel for the trigger is predetermined so that each trigger pull will advance the film by one frame. When trigger 26 is released, sprocket opening 34 slips over film release edge 33 and the trigger returns to its normal position. As trigger 26 approaches that position, hook 28 engages a new sprocket opening 34 in the film strip, the new sprocket opening having been advanced by the preceding trigger cycle. A stationary guide hook 60 attached along film guide 4 assists in holding the film strip in position during travel of trigger 26. Hook 60 is similar in design to film hook 28.

During the rearward travel of trigger 26, edge 27 engages and pushes against conductor 24. As shown by phantom lines in FIG. 2, at the rearward position of travel, edge 27 has forced conductor 24 against battery 21, thereby closing the electrical circuit between the battery supply and the light source. This circuit remains closed so long as the trigger is depressed. With the completed circuit, bulb 17 lights, and emits light rays through aperture 8 and through a frame of film 44 into the three lens elements and out of the projector. Since the lens elements in the preferred embodiment are fixed, focusing the image is accomplished by physical movement of the projector toward or away from a projecting screen surface (not shown).

When trigger 26 is released, the circuit for the light source is opened and bulb 17 is extinguished. The natural bias of conductor 24 acts spring fashion to force trigger 26 forward. This quick forward movement aids in the disengagement of hook 28 from sprocket opening 34 described above.

In the commercial embodiment of this invention light bulb 17 has a self contained lens that focuses the light rays toward aperture 8. The use of this bulb eliminates the need for three individual lens elements. In fact, the projector works satisfactorily with a single lens. In the dual nature of the projector of this invention, two lens elements are utilized for the commercial embodiment. However, it is contemplated that any of the disclosed lens combinations or a focusable lens system may be used in other embodiments.

In the second function of this projector, a rotatable arm 61 is attached to a two position lever 62 through a wall 63 of enclosure 1. Lever 62 has a projection position and a viewer position. A view screen 64 is attached to arm 61 by any convenient method. Epoxy or similar adhesive works well. Screen 64 is sized to fit within the cavity of body 50 and is rotated by arm 61 as lever 62 is placed in either of its two positions. In the projection position of lever 62, screen 64 is normal to light aperture 8, as may best be seen in FIG. 2. In the embodiment there shown, screen 64 consists of a thin, rectangular strip of frosted plastic. However, other translucent material, preferably similar in character to frosted glass, may be used.

A screen guard 65 is fixed along an edge 66 of screen 64. Screen 64 is rotatable to a position parallel to aperture 8 and is then interposed between the aperture and illumination source 16. In this position, the projector becomes a viewer and film 44 may be viewed through the lens elements. Screen guard 65 frictionally engages an edge 67 of film guide 4. The frictional force between the parts is sufficient to hold screen 64 in the viewer position. In this manner, the projector may be used in broad daylight as a viewer. Lowering screen 64 reconverts the device to a projector. In either function, the mechanical and electrical operation of the apparatus is as described above.

Numerous variations in the construction of the apparatus of this invention within the scope of the appended claims will occur to those skilled in the art in light of the foregoing disclosure. Thus, the location of the battery and the light source may be varied. Likewise, the number of optical elements in the lens system may be changed, or the system made focusable through the use of certain standard components. The design of conductors 19 and 24 may be varied, or the number of conductors changed. Changes in the conductors are immaterial so long as conductor 24 is in coactive abutment with trigger 26 and closes the electrical circuit as trigger 26 is pulled rearwardly. The shape or design of the enclosure, handle, or trigger also may be varied, for example. These variations are merely illustrative.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A projector toy comprising:
 - a. an enclosure defining a chamber;
 - b. a handle for holding said projector in the hand of the user attached to said enclosure;
 - c. a lens system mounted within said enclosure chamber;
 - d. an illumination source positioned within said enclosure chamber to admit light through said lens system;
 - e. a power supply positioned within said enclosure chamber;
 - f. means for electrically connecting said power supply to said illumination source, said electrically con-

necting means comprising at least one flexible conductor biased so as to provide a normally open circuit; and

a trigger slidably mounted to said enclosure movable between a first and a second position, said trigger adapted to abut said flexible conductor of said electrically connecting means in one of said first and said second positions in response to pressure applied to said trigger in order to close said normally open circuit, said flexible conductor biasing the trigger to the other of said two positions and having sufficient natural bias to move said trigger and open said circuit on removal of said pressure.

2. The toy projector of claim 1 wherein the lens system is fixed and comprises three elements.

3. The toy projector of claim 1 wherein the power supply is a battery.

4. The toy projector of claim 1 wherein said enclosure is divisible.

5. The projector of claim 1 further characterized by diffusing means mounted to said enclosure, said diffusing means comprising a light screen element pivotally mounted in said enclosure chamber and control means extending through said enclosure, said control means adapted to move said light screen element between at least a first and a second position.

6. The projector of claim 5 wherein said trigger includes a triangular shaped hook adapted for engaging a film strip along at least one side of said trigger shape.

7. A dual action projector and viewer toy comprising: an enclosure defining a chamber;
a handle for holding said projector in the hand of the user attached to said enclosure;
a lens system mounted within said enclosure cham-

ber;

an illumination source positioned within said enclosure chamber to admit light through said lens system;

a power supply positioned within said enclosure chamber;

means for electrically connecting said power supply to said illumination source, said electrically connecting means comprising at least one flexible conductor bias so as to provide a normally open circuit;

a trigger slidably mounted between a first and a second position with respect to said enclosure, said trigger being adapted to abut said flexible conductor and said connecting means in one of said first and said second positions in response to pressure applied to said trigger, in order to close said normally open circuit, said flexible conductor biasing the trigger to the other of said two positions and having sufficient natural bias to move said trigger and open said circuit on removal of said pressure; and

diffusing means mounted in said enclosure chamber, said diffusing means comprising a light screen element pivotally mounted in said enclosure chamber and adapted for movement between at least a first and a second position, one of said first and second positions interposing said diffusing means between said illumination source and said lens system and control means extending through said enclosure, said control means adapted to move said light screen element between said first and said second positions.

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