

The Low Cost Analogue Projector

Sayan Chatterjee.

Submitted: 15-08-2021

Revised: 29-08-2021

Accepted: 31-08-2021

The present invention discloses an Analogue Projector. In particular an analogue projector system with a unique “3D shadow picturing” effect (2-Dimensional projection with 3-Dimensional cues) configured with a page holder or slide holder of suitable size, a mirror of suitable size, an adjustable lens apparatus and an adjustable LED light set-up just below the lens apparatus. Moreover, in the proposed system, digital circuit can be included in order to make it more accurate, user-friendly while achieving better all-round experience.

INTRODUCTION

The present invention relates to an Analogue Projector system with a unique “3D shadow picturing” effect (2-Dimensional projection with 3-Dimensional cues). The analogue projector device is configured with a box of suitable dimension, wherein the inside walls have a first layer of aluminium acting as a heatsink to reduce the temperature inside the box during its operational mode and a second layer of black colour for making the walls inside non reflective. A 3-D shadow projection set up (Fig.2) comprising a page holder or slide holder of suitable size, a mirror of suitable size, an adjustable lens apparatus and an adjustable LED light set-up just below the lens apparatus is present in the embodiment. Moreover, in the proposed system, digital circuit can be included in order to make it more accurate, user-friendly while achieving better all-round experience.

DESIGN METHOD

A box of suitable dimension and made of suitable material. The top-side wall of the box being a door to get access inside the box. The inside walls have a first coating or layer of aluminium such as aluminium foil and a second coating of black colour on the first coating or layer of aluminium. Aluminium as heatsink reduce the temperature inside the box during its operational mode. To make the walls inside non reflective black colour coating is necessary.

A movable 3D shadow projection set-up placed near one wall inside the box (back-wall)

comprising: (i) a page holder or slide holder of suitable size (10) and, (ii) a mirror holder (9) for holding a mirror of suitable size. One edge of the page holder or slide holder (10) touches one edge of the mirror holder (9) with/without mirror of suitable size near/at the back-wall making 45° angle between them where the line of joining is parallel to the vertical bisector of the back-wall.

An adjustable lens apparatus (2) preferably of cylindrical shape and of suitable dimension mounted on the wall opposite of the back-wall (front-wall) so that the optical axis of the adjustable lens apparatus passes through the mid-point of the front-wall.

An adjustable LED light set-up (1) just below the adjustable lens apparatus mounted on the front wall powered by an external source or inbuilt battery set-up. During operational mode adjustable the LED light set-up (1) is adjusted so that it is parallel to the optical axis of the adjustable lens apparatus.

A hinged door (3) to cover front-wall from outside and a mirror annexed to it facing inside. During operational mode the hinged door with mirror is adjusted at 45° angle with the optical axis of the adjustable lens apparatus.

A flexible page holder or slide holder (5) of suitable size with pin (6) to hold the page i.e., a 2D projection set-up can be placed optionally between front-wall and back-wall at a suitable position to get simple 2D projection on projection surface (11) i.e., without 3D shadow picturing. This is dismantled during projection with 3D shadow projection set-up.

[000] In the preferred embodiment, the projection surface (11) is placed at an angle 90° with the optical axis of the adjustable lens apparatus (2) of the image projecting device.

[000] In the preferred embodiment, the adjustable lens apparatus (2) of the image projecting device is configured with a hollow cylindrical both end open tube with a convex lens at the outer end of the tube i.e., the end nearer the front-wall or a planoconvex lens fixed suitably at the end of the tube inside the image projecting device with curved side facing towards the back-

wall and a convex lens at the outer end of the tube i.e., the end nearer the front-wall.

[000] In the preferred embodiment the adjustments of different components of analogue projector device are made more accurate and user friendly through incorporation of suitable means such a digital circuit designed for this purpose at the space (12) provided for the same.

[000] In one embodiment, the digital circuit designed for automatic adjustment of different components comprise microcontroller.

[000] The preferred embodiment of the analogue projector set-up is capable of projecting any printed sheet of paper, writing on a sheet of paper, printed or painted images on a paper.

[000] In one embodiment, the box of image projecting device is made of wood.

[000] In another embodiment, the digital circuit can be included to project motion picture and/or digital object using the present invention.

[000] In one embodiment, top-side wall of the box being fixed and comprises of insertion channel(s) at suitable position(s) to insert a the 2D object to be projected. The insertion channel is closed after insertion of the object for a clear projection.

[000] In one embodiment, the box length is in the range of 44 cm to 50cm, its width is in the

range of 25 cm to 30 cm, focusing distance of 2D picture is in the range of 25.4 cm to 26.9cm and sheet of paper single/of a book having length 21.3 cm (maximum 21.5 cm) width 16.5 cm (maximum 18 cm).

[000] During operational mode power is supplied to switch on the LED light then the LED light set-up (1) is adjusted so that it is parallel to the optical axis of the adjustable lens apparatus (2). 2D object to be projected is placed upside down at the suitable page holder or slide holder facing the lens apparatus (2), then the lens apparatus (2) and the hinged door with mirror (3) is adjusted as required manually through suitable means or automatically depending on the embodiment, finally projection on the projection surface (11) is visible with clarity with 3D shadow picturing or a simple 2D projection i.e., without 3D shadow picturing depending on the slide holder used.

[000] During projection from a book given its thickness compared to a sheet of paper the 2D or 3D projection set-up is adjusted accordingly.

[000] The projection involving reflection of light rays can be understood by the person skilled in the art from the reference drawings.

Front and side view respectively AND PROJECTION VIEW(1)





PROJECTION VIEW (2)

[“lens adjustable hole total length 7.5 cm (outer hole -4.2 cm, internal hole 3.3 cm \ it would vary up to 8 cm).”- This part is creating ambiguity, is the lens tube uniformly cylindrical or has a conical tendency is not clear from this statement, if later advantage of considering such shape for the

tube must be provided. If not does this statement explaining about portion of tube should be inside and the portion will be outside or an expandable/foldable lens tube is used where the expandable part comes out to provide required adjustment to maintain focus and clear projection.]