

Analogue Projector with Automation Robotics System.

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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. Also we are adding servo mechanical system. Which can provide fully automation In “analogue projector”.

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

projection view.

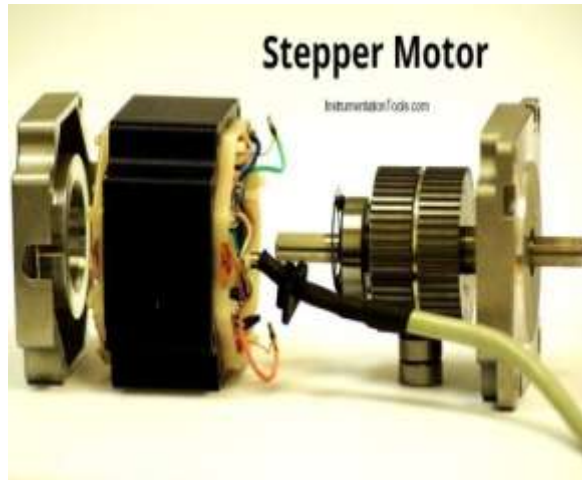
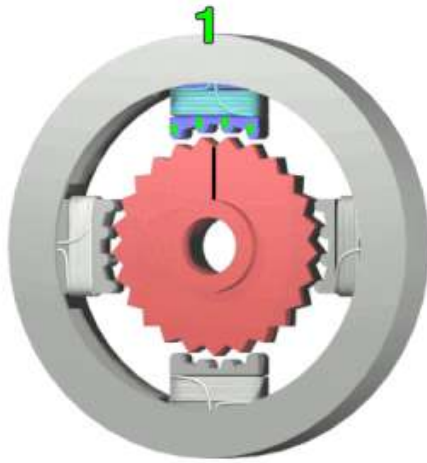


STEPPER MOTOR

A stepper motor, also known as step motor or stepping motor, is a brushless DC electric motor that divides a full rotation into a number of equal steps. The motor's position can be commanded to move and hold at one of these steps

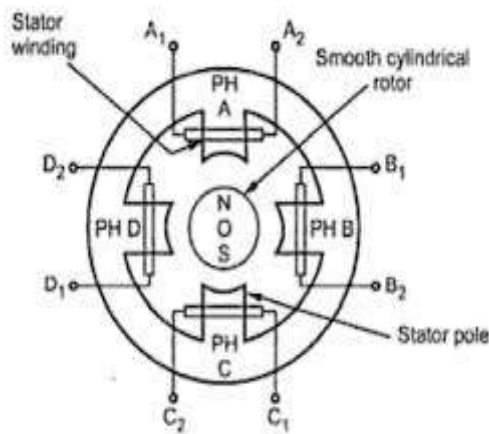
operational mode power is supplied to switch on the LED light then the LED light set-up is adjusted so that it is parallel to the optical axis of the adjustable lens apparatus . 2D object to be projected is placed upside down at the suitable page holder or slide holder facing the lens apparatus , then the lens apparatus and the hinged door with mirror is adjusted as required manually through suitable means or automatically depending on the embodiment, finally projection on the projection surface 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.

without any position sensor for feedback (an open-loop controller), as long as the motor is correctly sized to the application in respect to torque and speed. Switched reluctance motors are very large stepping motors with a reduced pole count, and generally are closed-loop commutated.

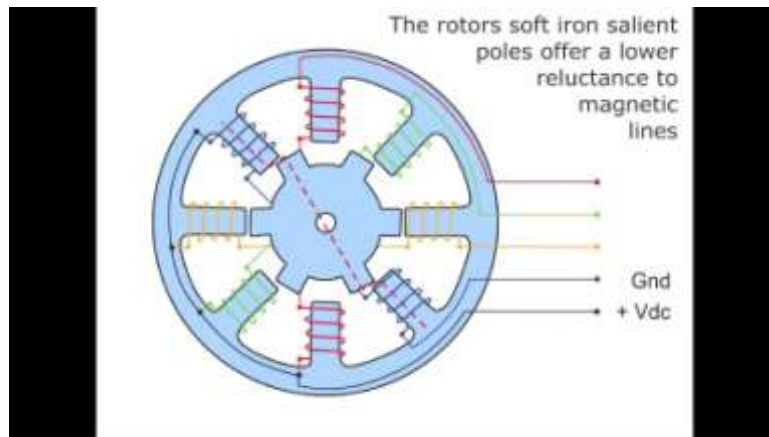


Types of stepper motor :-

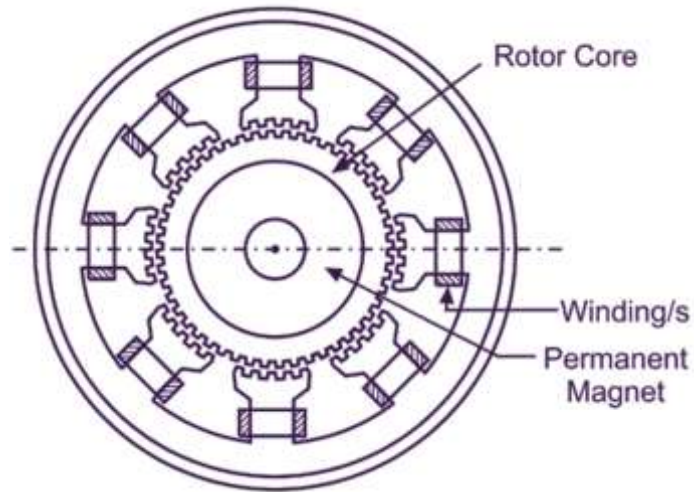
1. Permanent magnet stepper



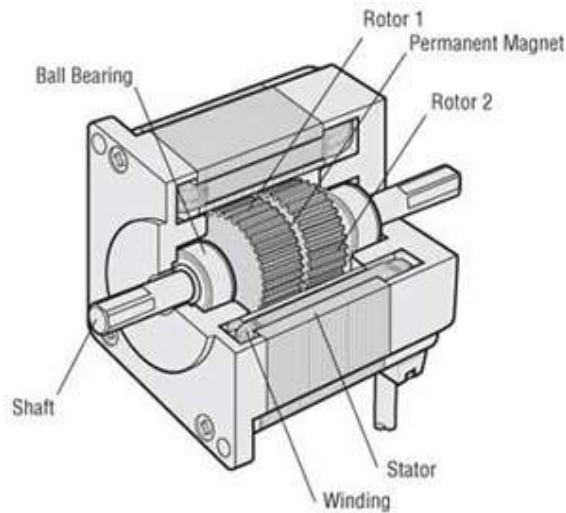
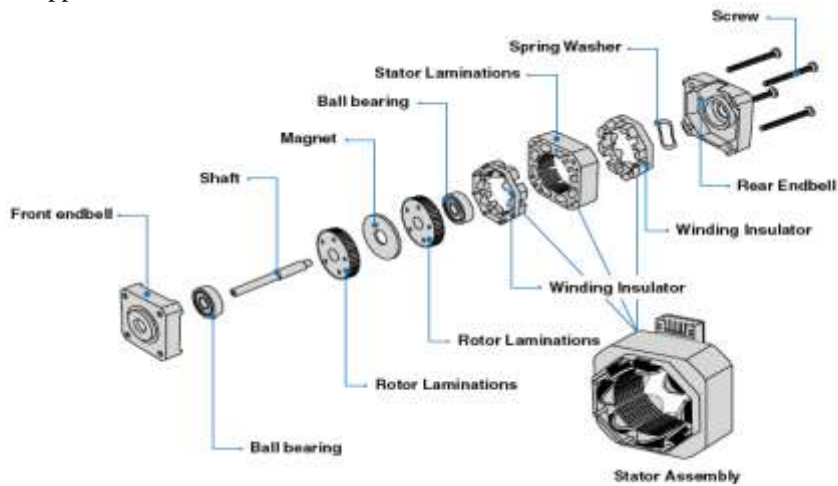
2. Variable reluctance stepper



3. Hybrid synchronous stepper



Internal parts of the stepper motor :-



Motor Structural Diagram: Cross-Section Parallel to Shaft

Types of stepper motor driver :-

There are different stepper motor drivers available on the market, which showcase different features for specific applications. The most important characteristics include the input interface. The most common options are:

- Step/Direction – By sending a pulse on the Step pin, the driver changes its output such that the motor will perform a step, the direction of which is determined by the level on the Direction pin.
- Phase/Enable – For each stator winding phase, Phase determines the current direction and triggers Enable if the phase is energized.

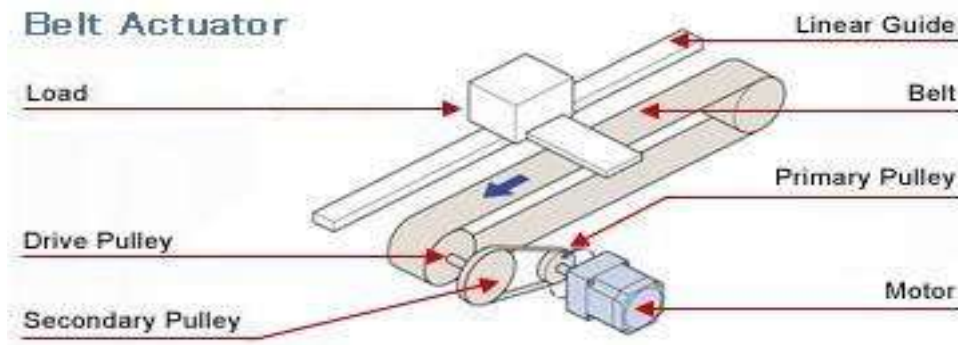
- PWM – Directly controls the gate signals of the low-side and high-side FETs.

Application in our project :-

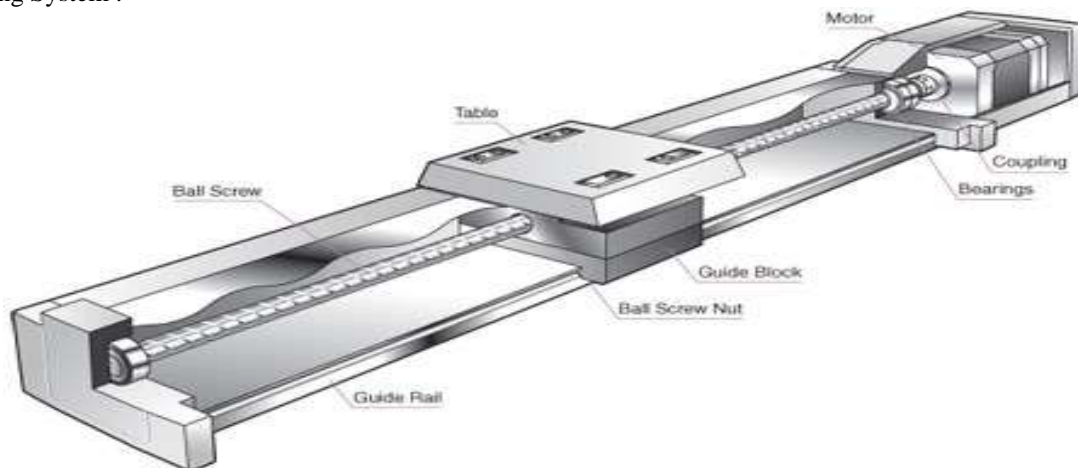
We are use the stepper motor in our projector this motor use for moving the slider automatically using ultrasonic sensors for detect the distance between wall and the projector . We are use Adrino for the controlling purpose . We are measuring the distance between wall and projector and also measuring the slider focus distance its transfer to the special code .

We use screw type stepper motor for moving the slider its use for user satisfaction for easy to hendal this product. Basically this system use for automation robotic system for the projector.

Belt System :-



Sliding System :-



CONCLUSION: looking back on this project Overall results to be observed. This product can give all-round Experience . this product can help for Education and other administrative service. This design is very useful for the future Technology. Automation with analogue system Is very affordable and much more user friendly.

SOME OF THE ADVANTAGES FROM THE ABOVE RESULTS

- 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.
- a digital circuit comprising microcontroller designed for automatic adjustment of different

components of the analogue projector is placed at the designated space.

- LOW COST & AFFORDABLE
- ANALOGUE PROJECTION POSSIBLE (FULL BOOK OR PAGE)
- WATER COOLING SYSTEM FOR COOLED
- FIRST SLIDEABLE LCD PANEL (NORMAL DIGITAL PROJECTOR ARE FIXED LCD PANEL)
- THREE FAN COOLING SYSTEM WITH RADIATOR
- AUTOMATIC FOCUS WITH SERVO MOTOR
- THIS PROJECTOR IS FULLY MADE BY BIO-DEGRADABLE MATERIALS (MADE BY WOOD)
- FULLY DETACHABLE SLIDER

Reference : "THE LOW COST ANALOGUE PROJECTOR"

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