Moving Escalator

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ABSTRACT

An escalator is a moving staircase conveyor transport device. The device consists of a motor-driven chain of individual, linked steps. Escalators are used to move pedestrian traffic in places where elevators would be impractical. Escalators are often used around the world in places where lifts would be impractical, or they can be used in conjunction with them. Principal areas of usage include department stores, shopping malls, airports, transit systems , hotels, arenas, stadiums and public buildings. Escalators have the capacity to move large numbers of people. They can be placed in the same physical space as a staircase. They have no waiting interval (except during very heavy traffic). They can be used to guide people toward main exits or special exhibits. They may be weatherproofed for outdoor use. A non-functional escalator can function as a normal staircase, whereas many other methods of transport become useless when they break down or lose power.

Most countries require escalators to have moving handrails that keep pace with the movement of the steps as a safety measure. This helps riders steady themselves, especially when stepping onto the moving stairs. Occasionally a handrail moves at a slightly different speed from the steps, causing it to "creep" slowly forward or backward relative to the steps; it is only slippage and normal wear that causes such losses of synchronicity, and is not by design. The direction of escalator movement (up or down) can be permanently set, controlled manually depending on the predominant flow of the crowd, or controlled automatically. In some setups, the direction is controlled by whoever arrives first. In this regard, escalators help manage the flow of people. For example, at many airports an unpaired escalator delivers passengers to an exit, with no means for anyone entering at the exit to access the concourse. Escalators are often built next to or around staircases that allow alternative travel between the same two floors. Elevators are necessary for disability access to floors serviced by escalators.

Keyword : - *Project Planning, Literature Review, Methodology, and Transformation of model etc….*

1. INTRODUCTION

An escalator is a moving staircase which carries people between floors of a building or structure. It consists of a motor-driven chain of individually linked steps on a track which cycle on a pair of tracks which keep them horizontal. Escalators are often used around the world in places where lifts would be impractical, or they can be used in conjunction with them. Principal areas of usage include department stores, shopping

malls, airports, transit systems (railway/railroad stations), convention centers, hotels, arenas, stadiums and public buildings.

Escalators have the capacity to move large numbers of people. They can be placed in the same physical space as a staircase. They have no waiting interval (except during very heavy traffic). They can be used to guide people toward main exits or special exhibits. They may be weatherproofed for outdoor use. A non functional escalator can function as a normal staircase, whereas many other methods of transport become useless when they break down or lose power.

1.1 Project Planning

To start of this project, a meeting with project guide in the first week is done to manage the schedule of weekly meetings. The purpose is to inform the guide on the progress of the project and guided by the supervisor to solve difficulty. Briefing based on the introduction and next task of the project is given by guide. Make research of literature review with the means of the internet, books, available published articles and materials that is related to the title.

2. LITERATURE REVIEW

There are many claims to the invention of the Escalators, but it is like that it was known, at least in some place in ancient times. Here some of the milestones in the history of the device. Invention and manufacturers: Nathan Ames, a patent solicitor from saugus, Massachusetts, is credited with patenting the first "Escalator" in 1859.He noted that steps could be upholstered or made of wood, and suggested that the units might benefit the infirm within a household use. In 1889,leamon Souder successfully patented the "stairway", an escalator type device that featured a "series of steps and links joined".

2.1 Methodology

MODELING

The escalator frame model has been entirely modeled by PRO E software. First of all sketch command of the pro e is opened. Then by using 2d commands sketch is created. Then the 3D model of escalator frame is created by extrudes command in pro e.

Fig –1: Basic Structure (Exoskeleton) of Escalator

2.1 Transformation Of Model

Then the model is converted in to the IGES format which is most suitable and easy access for any other software's. Using the IGES format we can import the escalator frame model from pro e to ANSYS. Now we can make structural analysis.

2.2 Parts Components

While making this Model of Escalator we have to made choice between some selective parts which we Buy from several Electronic shops and General stores, also online stores and due this pandemic situation sometimes we got the parts slightly overpriced but at last we made it to Last here is a list of some parts

- Hard Cardboard - 1
- 500 RPM Motor - 2
- Gears (Spur & Worm) - 3
- Shafts - 4
- Wheels - 5
- Bearings - 6
- Pipe - 7
- Circuit Boards - 8
- IR Sensor - 9
- Sticks - 10
- Power Adapter - 11

3. AUTOMIZATION

The IR sensor consists of:
Distance Adjuster: Changes detection distance. Vcc Pin: Provides 3–5 V input voltage. ... Out Pin: Transmits output signal from the sensor to Arduino. Obstacle LED: Turns on when light falls on IR Receiver. Power LED: Turns on when the sensor is connected to a voltage source. And we also having Power Adapter and Button

Fig: Circuit Board

3.1 MOTOR

An Electric Motor is an electrical machine that converts electrical energy into mechanical energy. Most electric motors operate through the interaction between the motor's magnetic field and electric current in a wire winding to generate force in form of torque applied on moto's shaft.

Fig -2: 500 RPM Motor

4. CONCLUSIONS

Hence we have studied about Escalator in this project also students can study more about an Escalator and their working process more significantly.
Escalators are an indispensable part of a mobile society. They keep people moving in virtually all areas of public life.
An escalator is a conveyor transport device for transporting people. Consisting of individual linked step that move up or down on tracks, which keep the treads horizontal.

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