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Survey on Full Height Sliding Flap Barrier for Security

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ABSTRACT: An unauthorized person (i.e. Tailgating person) easily gets entered in various places like Industries, banks, institutes, etc. in which we need a security system. Therefore we need such type of system in which we can count the authorized person which enters into institute and also unauthorized person. Full Height Sliding Flap Barrier is user friendly device used at entrances / exits to control & review traffic in and out of the premises. The operation of flap barrier can also be linked to access control systems with safety systems. Full Height Sliding Flap Barrier has fixed housing and a movable sliding type flap. The housing contain the motor, links, flap and control unit. In this project when a person give a trigger then the flap gets opened. Here we use trigger for entering. We can use other modules like thumb/palm recognition, face recognition, eye recognition etc. as per the need of security. When person enters signals from sensors are cut and according to that flaps gets opened. If the person enters from wrong direction after giving trigger then flap get closed immediately to avoid unauthorized entry. Also two persons are not allowed to enter at a time. We used alarm system for identification of an unauthorized entry.

KEYWORDS: Full height barrier; trigger; sliding flap barrier; tailgating person; User friendly

I. INTRODUCTION



Full Height Sliding Flap Barrier is user friendly device used at entrances / exits to control & review traffic in and out of the premises. The operation of flap barrier can also be linked to access control systems with safety systems. Full Height

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Sliding Flap Barrier has fixed housing and a movable sliding type flap. The housing contain the motor, links, flap and control unit. The access is from both the sides. The full height sliding flap barrier is a quick access gate that uses two bi-parting clear flap panels. The full height flap panels will ensure better control of illegal entry, against jumping or crawling under. When a valid open signal is present to the barrier, it will retract the two flap panels into the cabinets thus giving access to the user. Both units are operated by DC drive mechanism with a controller system that guarantees precise movement and positioning of the flaps.

II. RELATED WORK

A. RETRACTABLE FLAP BARRIER



The RB-1 / RB-2 retractable barrier has been developed to provide a user-friendly access control with high throughput & good aesthetic look for higher security applications where a visual/physical barrier is required. The RB-1/2 provide a solution to the common problems faced by the modern business environment, such as quick access for staff & visitors, while protecting assets, information & personnel from the danger of unauthorized entry, in an aesthetic environment. RB-1/2 consists of two or more adjacent housings with a barrier panel to create high-speed pedestrian walkways. Further housings (with two barrier panel & electronics back to back in one housing called as inter lane) may be inserted to increase the number of lanes of access. The RB-1/2 is truly bi-directional. The barrier panel react with a valid card read & retract inside the housings (in normally closed applications). In normally open mode of application flaps are always open.

B. SWING TYPE FULL HEIGHT FLAP BARRIER



Swing type full height flap barrier design is aesthetically pleasing. Its design consists of housing with built in control logic board (CLB). The design of the housing is made sleek and sturdy which results in less usage of space & reduced

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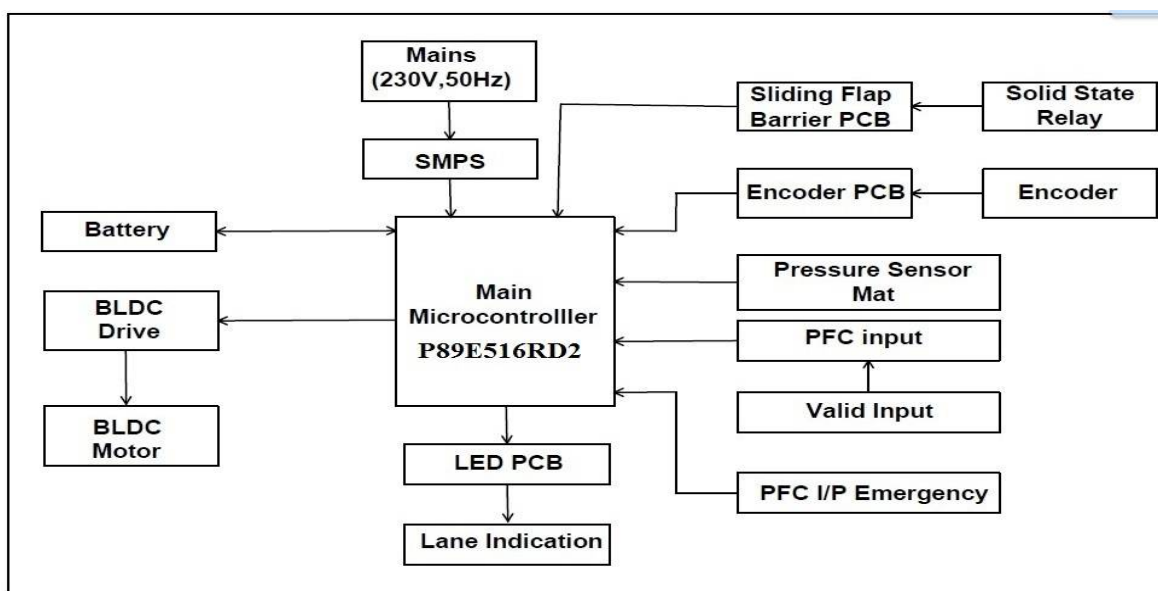
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weight. Two acrylic flaps obstruct passage. In this case the 2 gates will be able to provide well synchronized operation being controlled by one control signal. Astute visual indication can be incorporated into the flaps, this gives intuitive guidance to the pedestrian. The design ensures safe passage without entrapment & pinching points with safety clearance of at least 20mm – 50mm between the sliding flap doors. Worm shafts are made of steel and are case hardened to 58-60HRC and profile ground. The thread grinding in the gear ratios that the module value permits is carried out with ZI-Profile. This improves the contact between toothed surfaces and therefore performance and reduces operating noise. To guarantee long life, ball bearings of reputed make used. Gearboxes are filled with synthetic oil grade ISO VG 320 which is virtually maintenance free and does not require oil change.

The Full Height Sliding Type Flap Barrier is developed with full height flaps which overcomes the drawback of the Retractable Flap Barrier and ensures the safety from jumping and crawling. It comes with excellent design and high throughput.

Swing lane flap barrier needs extra space for flaps to swing forward and backward. So, this drawback is overcome in full height sliding flap barrier in which flaps slide in or out of model. It also Prudent & luxurious design that fits with any type of prestigious entry hall. Height of the sliding door restricts jumping and crawling. Sliding doors for quick opening & closing. It can be enhanced with tailgating feature. Flap Barriers can be intelligently coalesce with illuminating LED effect. Mechanical & electronic locking in closed position prevents fraudulent entry. These are the advantages of sliding flap barrier over all other system.

III. BLOCK DIAGRAM DESCRIPTION



A. FULL HEIGHT SLIDING FLAP BARRIER HAS FOLLOWING SALIENT FEATURES

- Full Height Flap Barrier comes armed with Brushless DC motor this ensures low maintenance & long life.
- Prudent & luxurious design that fits with any type of prestigious entry hall.
 - Height of the sliding door restricts jumping and crawling
 - Sliding doors for quick opening & closing
- It can be enhanced with tailgating feature.
- Flap Barriers can be intelligently coalesce with illuminating LED effect.
- Mechanical & electronic locking in closed position prevents fraudulent entry.



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- Triggers automatic opening in event of an emergency.
- Comfortable passage.
- It can be easily integrated with wide variety of access control system.
- Variety of attractive design for single & multiple installation are available.
- Full Height flap barrier is equipped with bi-directional throughput feature, made especially for quick access control in areas with high traffic but limited space.

B. OPERATION

Full Height Sliding Flap Barrier operates in normally closed mode. In the stand-by position, the passageway will be securely blocked by means of flap barrier. Upon receipt of an opening pulse from the access control system (Card reader), flap barrier will open. The access is from both sides. If card is shown to reader, the system will give a single beep for acknowledgment of reader input. Colour of LED on top of flap will change from Red to Green or Green to Red (depends on requirement). If card is shown from reader then the signal is sent to the main microcontroller P89E516RD2. Then it sends a signal to BLDC drive and motor rotates. Flap barrier will open & clear passage. As motor rotates encoder divides a resolution angle as a certain rate from 0° to 360° and specifies electrical code (BCD, Binary, Gray) to each divided angle position and sends this code to encoder PCB which contains the PIC16F886 and used to control opening and closing of flaps. Timeout for flap to keep open can be set from 1 to 15 sec (by default 3sec). After timeout flap barrier will come to its initial closed position. If the person enters from wrong direction after giving trigger then flap gets closed immediately to avoid unauthorized entry. Battery is provided for power backup purpose. Also an emergency input at Pin1 of main microcontroller is provided in case of emergency like fire. For more security we can also use Pressure Sensor Mat.

IV. TECHNICAL FEATURES

A. SECURITY FEATURE

- Unauthorized Entry: If anyone enters without access or without trigger from access control an alarm will be raised

B. SAFETY FEATURE

- Emergency Stop: Potential free emergency contacts are available in barrier. Potential free contacts can be operated from security cabin or control room. After activating the emergency stop button, the flap barrier will open. After resetting the emergency stop, the flap barrier will close slowly and lock. Full Height Sliding Flap Barrier is then ready for normal operation.
- Failsafe: In case of a power failure the Barrier will open with battery backup. When power is restored the barrier initializes, the flap will return to their original position and lock. The Barrier is then ready for normal operation.
- User Safety: The Barrier has user safety sensors to prevent the barrier from closing when a user is in between flap barrier passage and alarm will be activated after time out.

V. SPECIFICATIONS

- Operating Voltage: 180 to 270 V AC, 50 Hz.
- Opening & Closing Time: £ 3 Sec Typically.
- Control Circuit Voltage: 24 V DC.
- Nominal Power Consumption: 75 W.
- Capacity/Minute: 10 to 15 entries.
- Operating Temperature: 0° to +50° C.
- Dimension:



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TABLE 1.DIMENSION

Passage width (mm)	Overall width (mm)	Unit (mm)	Height
520	1160	1800	

VI. CONCLUSION

The Implementation of Full Height Sliding Flap Barrier physically restrains people from entering a secured area or premises and also helps us in keeping the track of unauthorized access. This project is truly bidirectional and capable to provide directional control. This project provides high throughput and tailgating feature.

It provides advantages like the security and reliability. The security features were enhanced largely for the stability and reliability of owner recognition. The whole system will be built on the technology of embedded system which makes the system more safe, reliable and easy to use.

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