

Design and Manufacture of Automatic Locking Mechanism to Block the Trigger of an INSAS Rifle by Using Nut and Bolt

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ABSTRACT: The use of this mechanism is undoubtedly one of the most important features for safety. Fields like army, in which rifles are used, safety comes first as it is the matter of life, so this mechanism serves the purpose of the safety by avoiding misfires from the rifle. This project deals in designing automatic locking mechanism to block the trigger of an Insas rifle by using RFID signal, control of servo motor and also with nut and bolt.

KEYWORDS: Design, Analysis, and Manufacturing.

I. INTRODUCTION

INSAS is primarily based on the AKM but incorporates features from other rifles. It has a chrome-plated bore. The barrel has a six-groove rifling. The basic gas operated long stroke piston and the rotating bolt are similar to the AKM/AK-47. It has a manual gas regulator, similar to that of FN FAL, and a gas cutoff for launching grenades. The charging handle is on the left instead of on the bolt carrier, similar in operation to the HK33. There is a change lever on the left side of the receiver above the pistol grip. It can fire a three-round burst or in semi-automatic mode. The cyclic rate averages at 650 rpm. The transparent plastic magazine was adapted from the Steyr AUG. The rear sight lies on one end of the breech cover and is calibrated to 400 meters. The furniture is either made for wood or polymer. The polymer butt and for end assemblies differ from the AKM and are more similar to that of IMI Galil. Some variants have a folding butt. A bayonet can also be attached to it. The guns take 20- or 30-round polymer magazines. The 30-round magazine is made for the LMG version, but can be also used in the rifle. The flash suppressor also accepts NATO-specification rifle grenades

Automatic locking mechanism for Insas rifle is a mechanism consisting of RFID signal, control of servo motor, nut and bolt. RFID is always in the butt of the INSAS rifle; whenever the person who operates the gun is away from the range of RFID signal the trigger of the rifle automatically gets locked. Because of this mechanism, trigger of the rifle gets locked and helps in avoiding misfire which may cause death. As this RFID signal is restricted to only one person to operate, it avoids the misuse of this rifle by other person.

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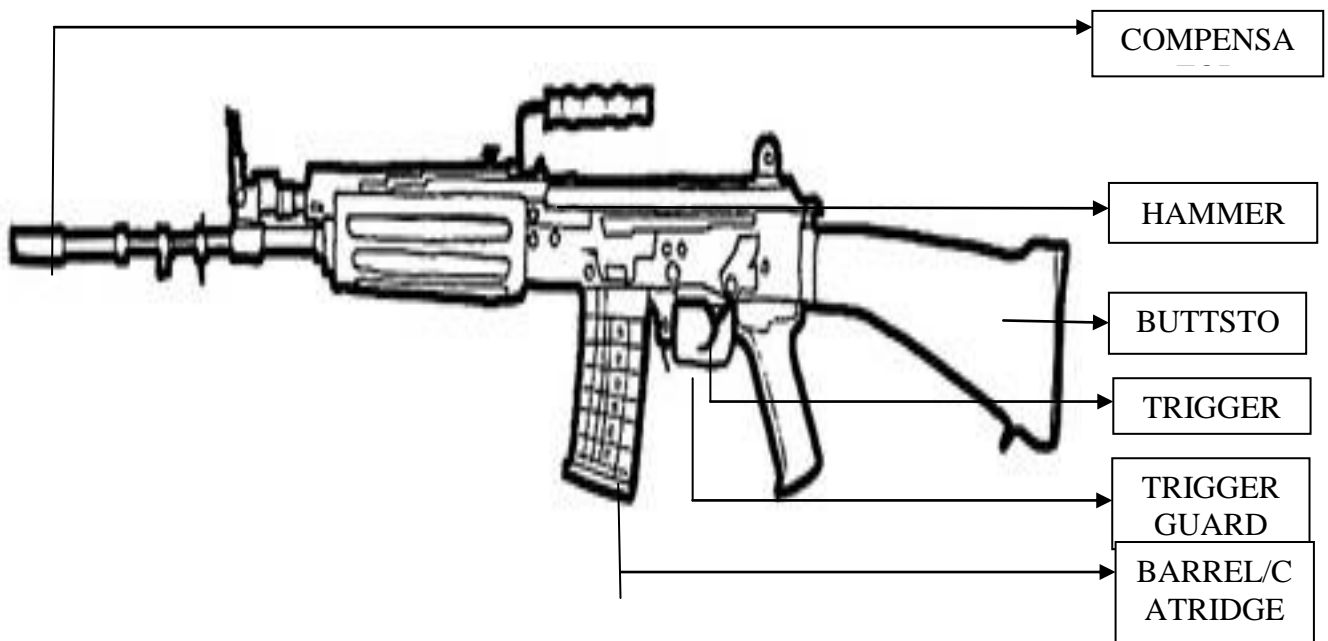


FIG: 1. IMAGE OF INSAS RIFLE.

II. MATERIAL AND METHODOLOGY

To design the model of bolt and nut mechanism used in automatic locking mechanism for INSAS rifle cad software CATIA V5R20 and to analysis the model ANSYS R15 is used and to be manufacture the model copper brite and bronze is used as materials by conventional method of manufacturing on lathe machine.

III. SCOPE OF PROJECT

This project helps in automatic trigger locking of rifle. Because of this feature, misfire and misuse of rifle is avoided. This feature in rifle is must for safety so this technology will be useful for the fields like army who uses INSAS rifle.

IV. PROPOSED METHODOLOGY AND DISCUSSION

In this project we deal with three different stages to get the proto type that we require,

1. Design,
2. Analysis and
3. Manufacturing.

1. Design.

Designing of the model of automatic locking system is done by using advanced CAD software CATIA V5R20. To design this model we need some input parameters for bolt, nut, L-key, cover, main housing, inner housing and servo motor like inner and outer diameter of nut, threading for nut and bolt, head of the bolt etc are to be consider. With the use of these input parameters designing is made.

2. Analysis.

Analysis of the model is done by ANSYS R15 software with the input parameters such as angular velocity and

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FUTURE SCOPE

There are several future recommendations that should be considered. When we are manufacturing we need to select the material which is rust free as rust make the mechanism block. We need to select the material which would not increase the weight for the rifle much.

V. CONCLUSION

In conclusion, the model that is design and manufactured is in working state that is, automatic locking mechanism of INSAS rifle to block the trigger which is design, analysed and manufactured using CAD V5R20, ANSYS R15 software and convectional manufacturing method is able to work with the desired functions. This model which is manufactured can be fitted into any other rifles with slit modifications in real time, with their requirements by using these procedures as guidelines.

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