CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In manufacturing industry, the mass production with the high productivity targets the lowering in cost and interchangeability to promote easy assembly. As to increase the manufacturing rate and improving the inspection process, the supporting devices are necessary.

Jigs are the special purpose tools that used to ease processing like machining, assembling and inspection operations. Jigs provide an average of manufacturing interchangeable parts since they set up the tolerances between work and the cutting tool.

Jigs are used on most of the machining processes drilling, reaming, tapping, milling and grinding. There are many advantages using the jigs in the production. Jigs eliminate the individual processing, making, positioning and lessen the inspection. This reduces the production time and improve the efficiency and productivity.
1.2 PROJECT BACKGROUND

Drill bit sharpening jig known have tended to be complex, expensive difficult to adjust, or inexpensive and incapable of precision sharpening of drills, thus hindering the desired cutting lip surface.

Basically, the operator needs to have a jig to ensure the exact and consistent cutting of the drill bits whether the operator has a high or low skill on the manual drill bits sharpening. During manual grinding, the operator tends to use the bare hand without the aid of other apparatus. Thus, it will lead to vibration during the process of grinding and may affect the microstructure of the drill bits, the surface finish as well as the operator own safety. Besides, the usage of the jig can avoid the excessive residual stress and vibration comes from the grinding process.

Thus, as to avoid the loading stress on the jigs, the material selection must be correctly done. This is because the material should be suitable to prevent the residual stress on the drill bits and the jig itself. Besides the measurement for available attachment place for the bench grinder must be considered so that it fits well.

1.3 PROBLEM STATEMENT

In recent years, the sharpening of the drill bits has become significant. A dull drill bits shall lesser the performance of the drilling process and subsequently lower the tool life. Thus, these project is to study the behavior of drilll bits during grinding process and enhance the safety of equipment, structures, and lead time to sharpen the drill bits.
For instance, the unevenly emergence of swarf, oversize or rough hole, drill point appears to wobble and make drill press shakes are some of the problem encountered during drilling using the defected drill bits. This may cause by the off-centre point angle, unequal cutting lip length or angles (Edgar, 2013). Resharpen the drill should fix the problem by following the right steps and procedure.

Besides, the squeaking and slow penetration of the drill bits frequently produced. These are due to the dull cutting edge and the insufficient lip clearance behind one lip (Edgar, 2013).

During sharpening of drill bits, the a high quality clamp is not only holds the workpieces firmly together but the jig also must also be able to retain its position steadily in order to produce a smooth outcomes.

Thus, a jig is fabricated to solve this problem with better specification. The jig must be able to hold the drill bits and made of the high stiffness material as to absorb the shock and vibration during the process.

1.4 PROJECT OBJECTIVES

The aim of this project is to design and fabricate the drill bits sharpener that promote better outcome rather than manual drill bits sharpening process that may vary due to the skill of the operator. Besides, the objective of the project is also fabricate the jig that can attached at the bench grinder.