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WHITE PAPER

THE USE OF A HEXAPOD DEFLASH AND DEGATE CASTINGS

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ABSTRACT

CNC and CAD/CAM based 2, 3 and up to 5-axis machining has been commercially viable for some time now. The process in which a manufacturer plans and prepares a part for automated manufacturing is well known. However many companies in the casting industry do not take the time or have the resources available to use this technology to help themselves remove the flash from their cast parts. Utilizing the 6 degree of freedom features of our hexapods (Fig. 1) and the manual operator's skills at deflashing parts we believe we can help companies utilizing manual processes to automate. By manually moving our robots and gathering information to help the casting firms develop the programs needed to run these parts.

THE PROBLEM

Many of today's casting manufacturers create very complex castings that require a substantial amount of deflashing and degating. (Fig. 2)The process they currently utilize to perform this task is primarily manual labor in conjunction with various grinding and cutting tools. With increasing competition and pressure to cut costs and improve quality, companies are looking for ways to reduce the amount of labor involved in this process. However the conventional tools used in other industries to solve this problem will create too much chaos for the casting companies because they have not invested in the necessary talent or equipment to economically follow this path. Along with the cost, the amount of time needed to implement this drastic change will require a large risk component and not solve their immediate need.
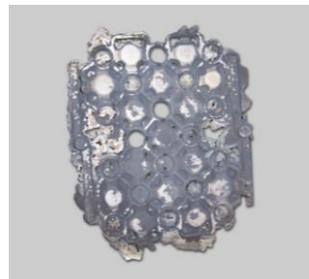
Fig. 1 Mikrolar P-2000™ Hexapod

Fig. 2 Castings with and without flash

Essentially the customer would like easy to use off-the-shelf tools to help them to use their existing employees more effectively and to drastically cut down the time and effort required to clean castings as they come out of the mold.

Fig. 3 Logitech's™ Spaceball

THE SOLUTION

By using their existing tooling, workforce and skill sets to attack their problem, our goal is to use what the operators already know how to do and combine it with simple learned communication with a machine interface and allow the operators to become the programmers of the repetitive parts they are trying to automate.

For the measuring portion of this application we propose that the operator will manually push the casting mounted on our hexapod into their existing tools degating and deflashing the part as they normally do. (Similar to Fig.3) Our machines will remember the process and the path for repetitive functionality.

After the initial path/part is made additional parts will be made on one of our machines that runs the program created by the above manual process. Both devices will require a rotary table on the top of the hexapod to allow the operator maximum flexibility. (Fig 4)

Fig. 4 P 2000™ with rotary table

Along with the hexapods, the customers tools will need to be fixtured and presented in a way that allows the operators to be comfortable in using the hexapod to perform the needed trimming. Also this process will need to be conducive to forcing some amount of structure and procedure to how the parts are handled and how the programs are organized.

The flexibility of these machines does not come at the expense of other requirements. Due to the compact nature of mechanism, and low power demands these devices can be very attractive to a portable environment. In addition, the simplicity of the machines and the use of "off-the-shelf" components facilitates easy repair/replacement and "in the field" serviceability.

CONCLUSION

This should allow the customer to use his existing tools, staff and skill sets to dramatically improve their processes without an immense learning curve.

A natural derivative of this undertaking should be that many of the company's manual operators will become schooled in the basic building blocks of machine programming. As this education progresses they will likely find more creative, efficient and effective ways of applying these tools and further improving their in-house processes.