Machine for Replacing Disc tools

Field

The invention relates to the field of automation and, particularly to a machine for replacing disc tools.

Background

Disc tools such as grinding discs lose their grinding surface rapidly in automated applications, e.g. when the grinding discs are used by an automated robot or another automated machine capable of using various disc tools. Automated solutions in replacing the disc tools are needed to improve efficiency.

~~Brief description~~Summary of disclosure

~~The invention is defined by the independent claims.~~

~~Embodiments are defined in the dependent claims.~~

In accordance with an aspect of an embodiment of the disclosure, a method for automatically changing a disc tool to a tool holder of an automated machine working with disc tools. The method ~~comprising~~includes in a disc tool replacement machine: detecting that the automated machine has replaced a tool holder, causing a gripper to move a tool holder released by the automated machine to a replacement area of the disc tool replacement machine for replacement of the disc tool; determining that the tool holder is in the replacement area in the disc tool replacement machine; unfastening a fixing member of the tool holder by applying an unfastening force to the fixing member, wherein the fixing member fixes a disc tool to a backing plate of the tool holder through a through hole at a centre of the disc tool; removing the disc tool from the tool holder after said unfastening; inserting a new disc tool to the tool holder; fastening the fixing member of the tool holder by applying a fastening force to the fixing member, thus fixing the disc tool to the backing plate of the tool holder through the through hole; and causing the gripper to move the tool holder to a second area to wait for the automated machine to change the tool holder.

List of drawings

Embodiments of the present invention are described below, by way of example only, with reference to the accompanying drawings, in which

Figure 1 illustrates a disc tool replacement machine according to an embodiment of the invention;

Figure 2 illustrates a frame of the disc tool replacement machine of Figure 1 according to an embodiment of the invention;

Figure 3 illustrates a transfer unit for moving tool holders for replacement of the disc tool according to an embodiment of the invention;

Figure 4 illustrates components used in the replacement of the disc tool according to an embodiment of the invention;

Figure 5 illustrates an embodiment of a tool holder;

Figure 6 is a flow diagram illustrating an automated process for replacing disc tools according to an embodiment of the invention;

Figure 7 is a flow diagram illustrating disc tool replacement when the disc tool replacement machine replaces several types of disc tools according to an embodiment of the invention; and

Figure 8 illustrates areas of the disc tool replacement machine.