Camera-based detection of the workpiece and its position

Current Situation

An optical detection of the position of the workpiece offers an essential speed advantage in contrast to the conventional detection with a touch probe, since no starting positions for touch probe approach moves have to be defined and no slow measuring movements have to be made with the machine tool for measuring. Due to the contact-free method of measuring, no collisions can occur.

For the automatical detection of the workpiece position, an intelligent camera system with an included position detection algorithm is to be integrated into the working area of the machine tool and connected to the control, so that the position of the workpiece can be determined automatically before the beginning of the execution of the NC-program.

Realisation

The position detection of the workpiece is started automatically through the NC-program or manually. Afterwards, the control moves the machine table with the workpiece into the measuring position relatively to the camera. The captured camera picture is matched with a model of the workpiece defined in the nominal position and by that the deviation from this theoretical position is determined. The position of the workpiece is transferred to the control, which then adapts the operations defined in the NC-program to the changed position.

Furthermore, based on optical triangulation, the shape of the workpiece can be detected. The real shape of the workpiece can be verified against the requested geometry and, thus, it can be assured that no unforeseen collisions can occur.

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