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(57) Abstract :

This invention presents the automation of tool selection system for ultrasonic assisted turning (UAT) process. This system is designed to reduce the idle time during machining and human errors by automatic selection of horn-tool combination, frequency and amplitude based on the work-piece material to be machined. Automatic selections are done by the controller based on the optimal data stored in it. Automatic positioning of required horn-tool combination is done by automatic tool changing arm and ensured by radio frequency identification (RFID). Required frequency and amplitude is generated from frequency generator and vibrometer mounted on the tool post measures these vibrations and amplitudes for any rectification. Data of cutting forces in measured by dynamometer placed beneath the tool post and can be viewed in real time. This real time analysis of cutting forces shall be helpful in tool condition monitoring. As the value of cutting forces cross a predefined limit, machining will stop and the cutting tool would be replaced. Controller ensures the synchronized working of the whole system.

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