Attentive Workbench: An Intelligent Production Cell Supporting Human Workers

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In recent years, manufacturers are required to maintain wide variety of product lineups according to diversifying consumer trends. Instead of conventional manufacturing lines, cell production systems, in which a single human worker assembles each product from start to finish almost manually, have come into wide use in order to accommodate diversified products and production quantity. With negative and zero growth of the population and the tendency of young people avoiding manufacturing jobs, we will face a shortage of skilled workers, and hence a great difficulty in maintaining the cell production system.To meet diverse needs with fewer labor forces, we propose attentive workbench (AWB), shown in Fig.1, together with researchers in the University of Tokyo, such as Prof. Takamasu in the Dept. of Precision Engineering and Lecturer Kotani in School of Frontier Science. AWB recognizes the intention or the condition of a worker through cameras and vital signs monitors, presents the information through projectors, and supplies assembling parts to the worker using self-moving trays. This informational and physical assembly support may result in a higher yield rate and productivity.The present system has been implemented (Fig.2), and physical support of simple product assembly using self-moving trays has been demonstrated (Fig.3).

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Keywords: Cell Production System, Attentive Workbench (AWB)

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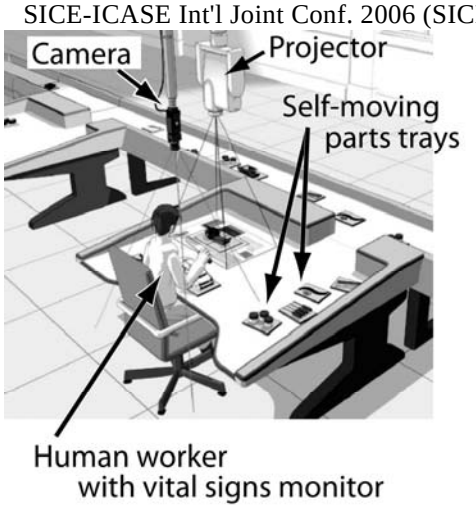

Fig. 1 Overview of Attentive Workbench

Fig. 2 Prototype Model

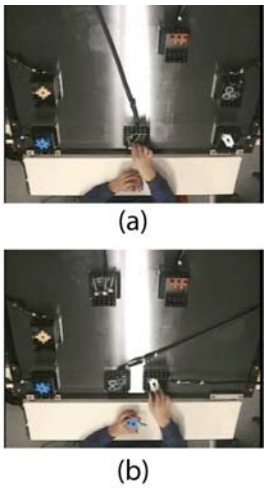

Fig. 3 Demonstration of Physical Assembly Support