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ЧАСТИНА 1

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INFORMATION EXPERT SUPPORT SYSTEM
FOR FIXTURE DESIGN

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Fixture design plays quite an important role in the production of the high quality and competitive production items, especially in the multiproduct manufacturing. The latter requires expedient retooling in terms of other parts machining. The necessity of implementation of computer-aided technologies particularly computer-aided fixture design (CAFD) is connected with the considerable labor content of the technological design as well as some optimization tasks.

Methodologies and approaches to CAFD systems have been analyzed on the basis of the up-to-date scientific literature. It has been made clear that the basic CAFD system structure consists of such modules as: income data module; setup planning; fixture planning; fixture configuration design; fixture design verification. According to our vision it would be expedient to develop and implement the fixture configuration optimization module. It will enable to carry out optimization calculations of the optimal fixture configuration in the automated mode for predefined production conditions. The availability of the information expert support system to contain the constant, input and output information is one of the important conditions of the effective work of any CAFD system. The system should ensure the computer-aided fixture configuration design using the functional element libraries (including locating, clamping, and supporting elements), the library of fixture configurations (formerly developed), the library of metal-cutting machine tools, the library of cutting tools, the library of reference information, the library of locating and clamping schemes, etc.

The fixtures coding system has been created. It represents letter and figure code in accordance with the functional application, element and dimension type. The library of the functional elements has been created too. Currently it includes 35 locating, 9 clamping and 26 supporting elements with the possibility of further augmentation. Each functional element from the library has 2D and 3D models, technical information as well as the information on some reasonable application.

CAFD system application is possible at some machine building plants closely related to part machining. The offered information expert support system will enable to increase CAFD functionality and cut down the time for production planning in multiproduct manufacture.