CONTRIBUTIONS TO PROCESSING THE SURFACE WOOD CARVINGS

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Abstract

The novelty of the field, how to approach the problem, iterative development and testing, using a newly created machine retrofitted enough in the software, collaboration with other institutions, all make this work to make part of advanced research, combined with advanced engineering. In woodworking, and especially the sculptural surfaces typical was the "work of art" sculptor, designer, artisan, who came to the "artistic" concept and development was manual or based on templates.

Key words: sculptures surfaces, CAD-CAM, drawing, CNC Fanuc .

INTRODUCTION

Extension of the concept of 5-axis simultaneous machining wood is still a new technology that procedure.

- Even metal processing technology is new for each case separately, requiring testing, probing, parts of slaughtered sample (made of cheaper materials) to validate the final technology (Dogaru, V.,2003).
- Now this part is developed virtual 3D space using advanced CAD software, remaining true contribution "artistic" the designer, but by other means (Radu, A. , Curtu, I.,1981), (Râmbu, I. et al. 1980).

The product CAD-CAM now apply advanced technology, the machine able to "carve" the effect.

MATERIAL AND METHOD

Experiments of this work were conducted in the laboratory of the University of Oradea in 2014, the processing center TMA-AL-550 (5-axis simultaneous) flexible cell component described below. THE FLEXIBLE CELL TMA 550 of the Computer Integrated Manufacturing Laboratory, University of Oradea, Faculty of Engineering and Technology Management is a self realization of the University of Oradea retrofitting scheme, fig. 1 (Ganea M., 2001), (Ganea C., 2003), (Ganea M., 2004) , (Morar L., 2006), (Sebe A., 2004).

The car meets all the requirements to be called flexible manufacturing cell. The Fanuc 30i CNC equipment and related programs

have been implemented so that gradually, as various works on the machine running, complete machine software database (Derecichei L., Lucaci, C., 2013), (Ganea M., 2010), (Ganea M., 2009), (Ganea M., 2000).

Fig. 1 - Flexible Cell TMA AL 550

RESULTS AND DISSCUSIONS

Solid wood blank was performed using VALFURNITURE Borod company, which is one of the leading manufacturers of wooden tables and chairs in the northwest, and the largest of this type of activity in Bihor County (www.fanuc.it; www.5-axis-cnc.com).

Fig. 2- The presentation of wood workpiece

In fig. 3 show different views of technological equipment (Vickers, G.W., 1993):

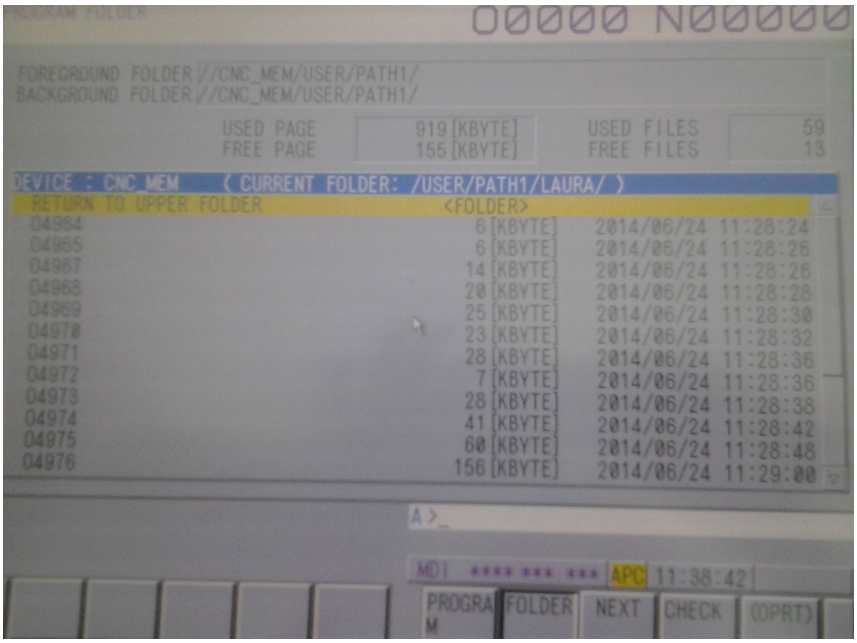

Fig. 3 - Presentation equipment, sequence of the work program of the machine

In fig. 4, 5, 6, 7 are submitted to during processing of workpiece sequence (Derecichei L., Ganea M. 2013), (Derecichei L., 2014), (Derecichei L., Ganea M. 2013).

Fig. 4 Sequences during processing (3-axis roughing)

Fig. 5 Sequences during processing (3-axis roughing)

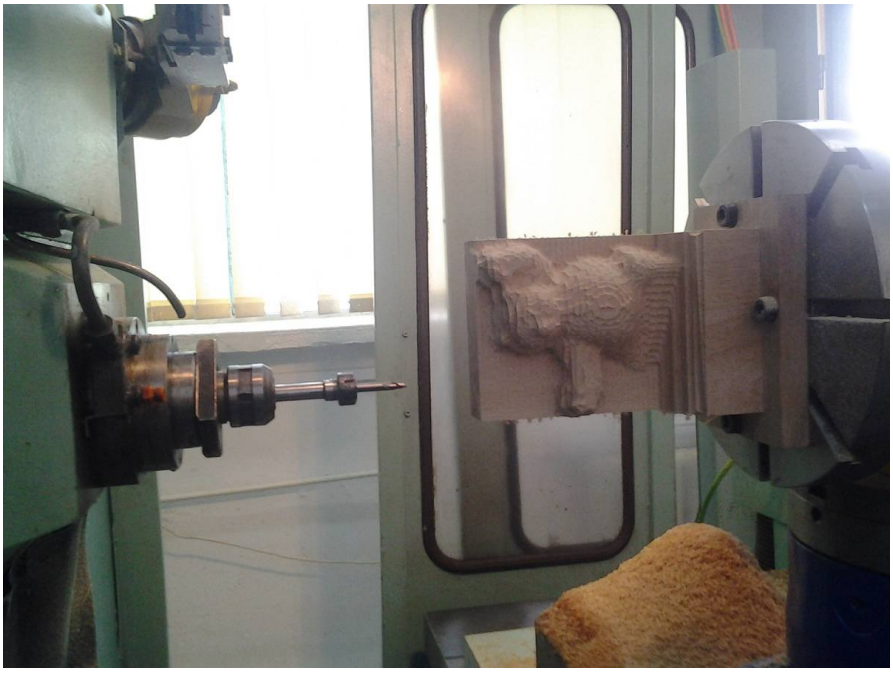

Fig. 6 Sequences during processing (3-axis roughing)

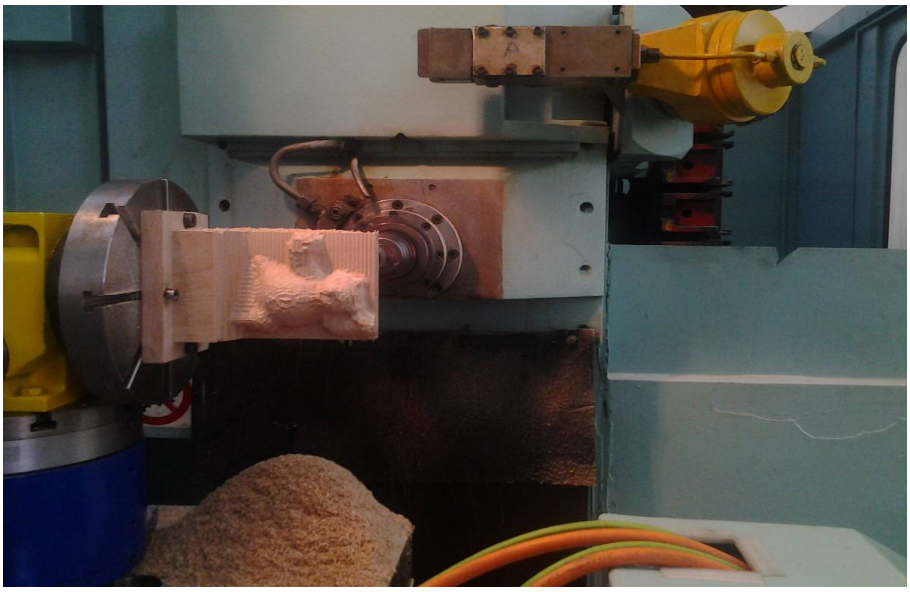

Fig. 7 Sequences during processing (3-axis roughing)

CONCLUSIONS

The of wood sculptural surfaces machining using CNC 5 axis simultaneous increase economic efficiency, reduce costs and increase processing accuracy.

Sculptural surfaces being processed processing concept have pointed to the peculiarities of anatomical structure of wood (annual rings, fiber, medullary rays, etc.) regimes of processing it.

In the woodworking CNCS uses watermark on ornamental surface treatment that is normally done by hand or sculpture copying milling machines, in which case it is necessary to make templates. The artistic works, restored of wood objects can be modified with advanced CAD-CAM procedures in cyberspace and beyond will be processed in 5-axis simultaneous CNC.

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