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CONTROLLED PARAMETER MODELLING OF CASTING PIECES BUSHING TYPE

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ABSTRACT:

The workpaper proposes a computer assisted modality of projection in order to obtain casting semiforms, starting from the 3D totally standardized model of the casting piece. The advantage of such a method is that the changing of the casting piece parameter values induces an instant changing of the semiforms at the new dimensions of the casting form.

1. Introduction

In order to realize the 3D model of the casting piece bushing type, we start from the execution scheme of the final piece to which we add the technologic and adaptation additions according to the actual standards, in this way resulting the scheme of the gross casting piece that will be the basis of the whole modeling. In the first part of this workpaper a model of the casting piece is obtained, while in the second part the inferior casting semiform and the inferior carriage is obtained.

2. Modeling the casting piece

In order to obtain the gross casting piece some steps have been followed in obtaining only one "Part": modeling of the

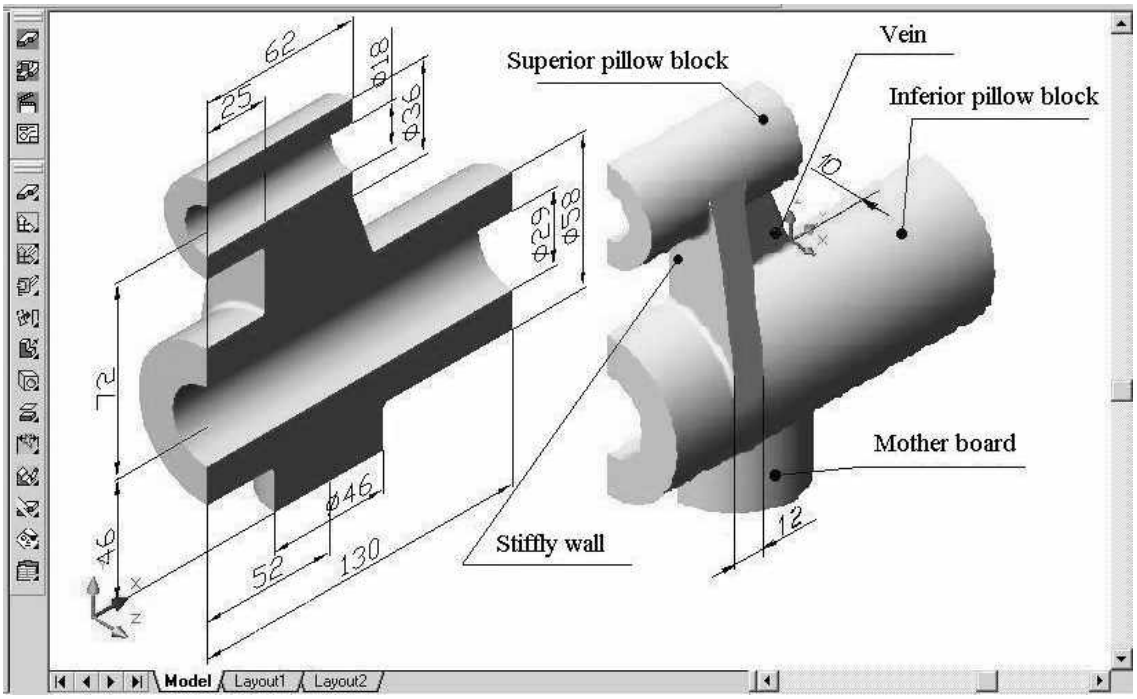


Figure 1. Gross casting which is modeled

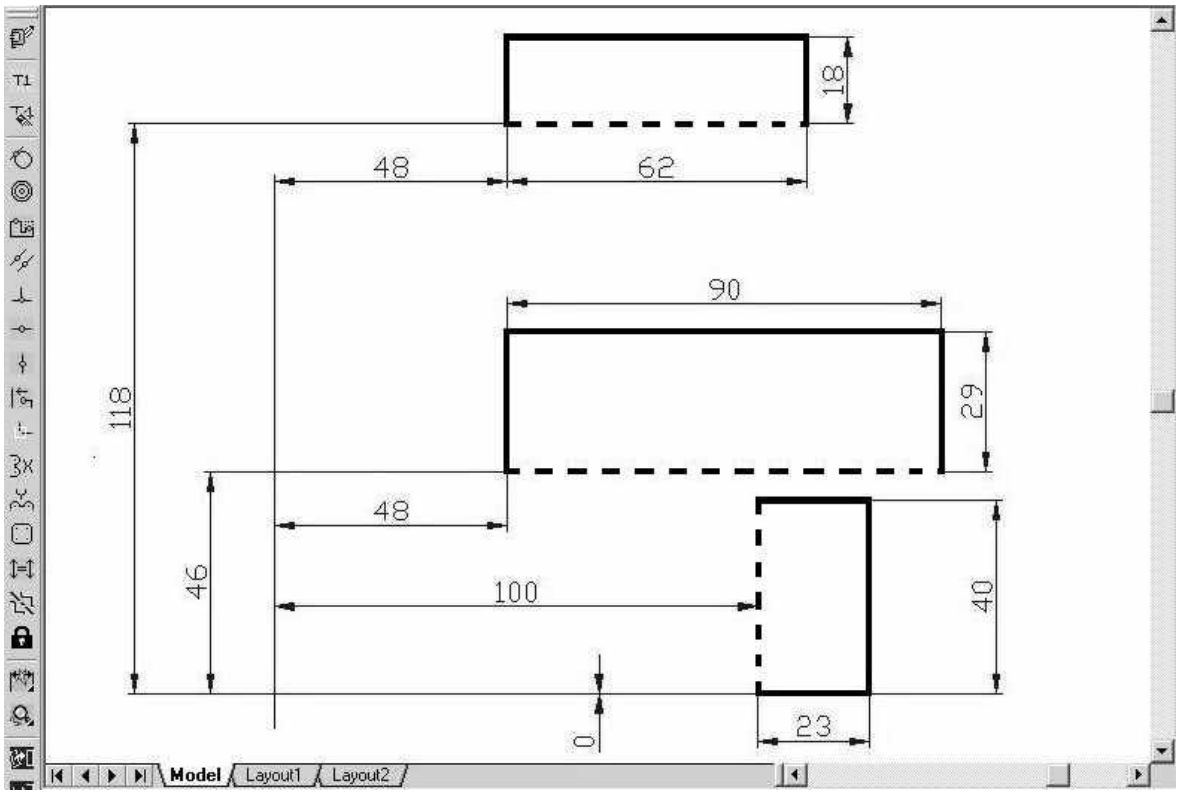


Figure 2. Value quotation of the generating rectangles

three cylinders, obtaining of the hard plate and nervure, operating the holes and defining the parameter links at the hard nervure level that are meant to allow the quick modification of the 3D results. The gross casting piece that is to be modeled, together with the component elements and the adequate levels, is presented in fig. 1. In order to take advantage of the assisted projection, we start from defining a "Work Point" in "Model Space" as bench mark for the three generative rectangles with all necessary levels, which, through rotation movement around interrupted line mapped out arms, is generating the three above mentioned cylinders. We must stress that in the first stage the levels are given as values, as it is shown in fig. 2, but in the next stage they should be turned into equations in order to allow the parameter modeling of the hard wall whose dimensions are given, on a hand, by the distance between the axis of the inferior bushing and the superior one and, on the other hand, by the external diameters of the two bushing cylinders. This fact will allow any modification of the external diameters of the two bushing cylinders to induce an instant up-date of the hard nervure. In fig. 3a it is presented the generated profile of the hard wall and the result of the generation, and in fig. 3b it is shown the modality of defining the nervure through specialized command “Rib”.

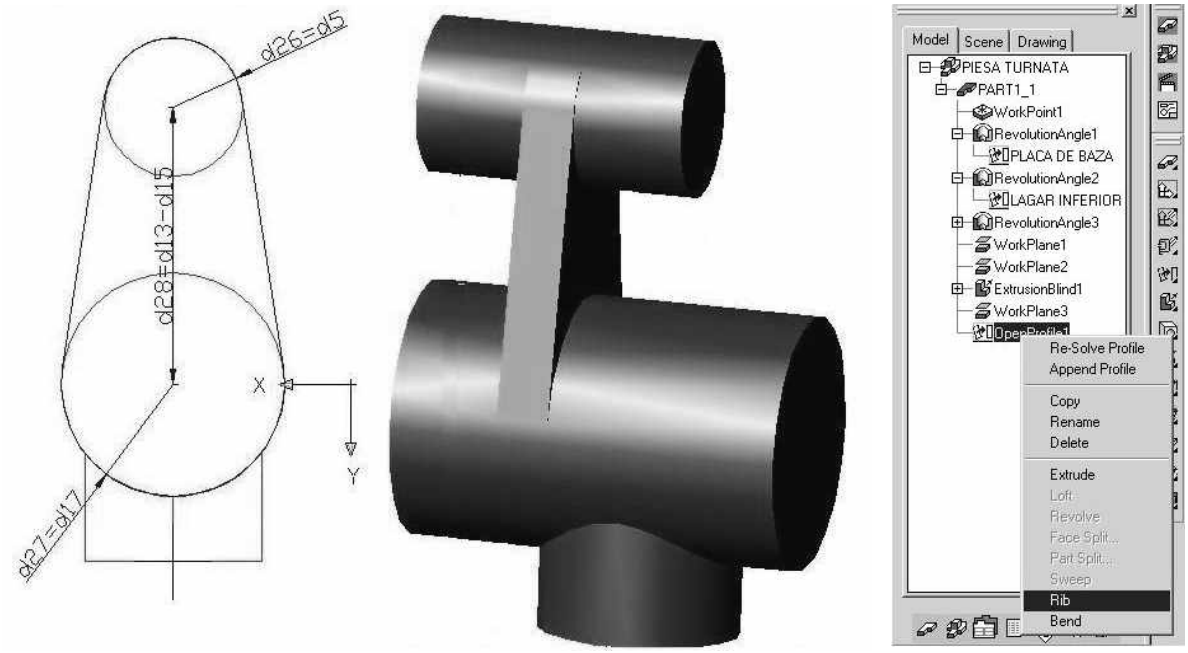
3. Modeling of the semiform and the inferior carriage

For modeling the inferior circular semiform we start from an circle “Profile” type, which through the command “Extrude” leaded to the obtaining of a cylinder from which, in the next stage, through command "Combine" option "Cut", the impression of the first stage model is created. To this impression, also through option “Cut”, is added the impression of the charger and the casting filter foot. Going forward, through command "Extrude" with options "Base" or "Cut", it was obtained the inferior semiform carriage and one of the catching ears. The second catching ear was obtaining through mirroring with command "Mirror" option "Joint". The result of the modeling is presented in fig. 4.

4. Conclusions

This method is proposed to project the hot sectors and has the advantage that through the changing of the form and the geometric dimensions of the model, it is obtained an instant change of the casting semiform. Extending the method, in conditions of levels correlation, it can be obtained even the instant

change of the carriage. This above mentioned advantage is underlined in fig. 5 and 6, that show the correlation between the new, modified, levels of the model and the casting cavity dimensions.



a) *b)*

Figure 3. Defining of the hard wall and the nervure

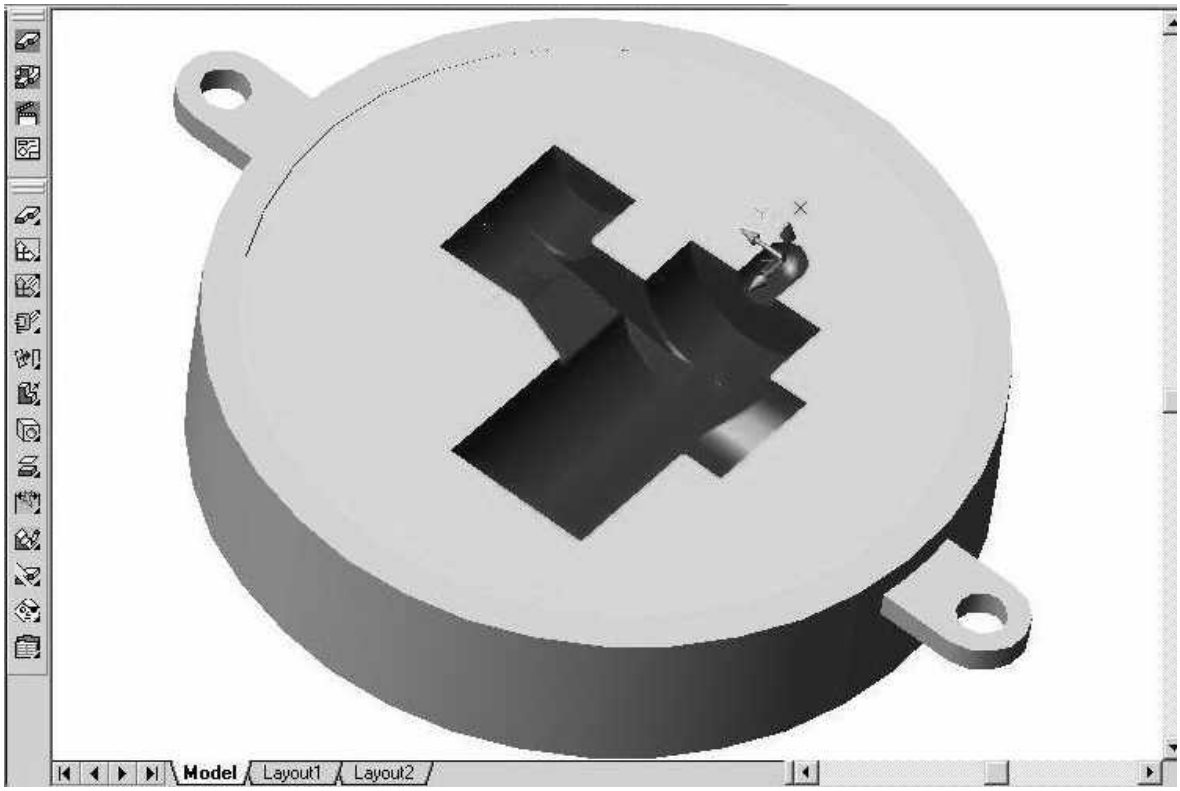


Figure 4. Frame-work and inferior semiform

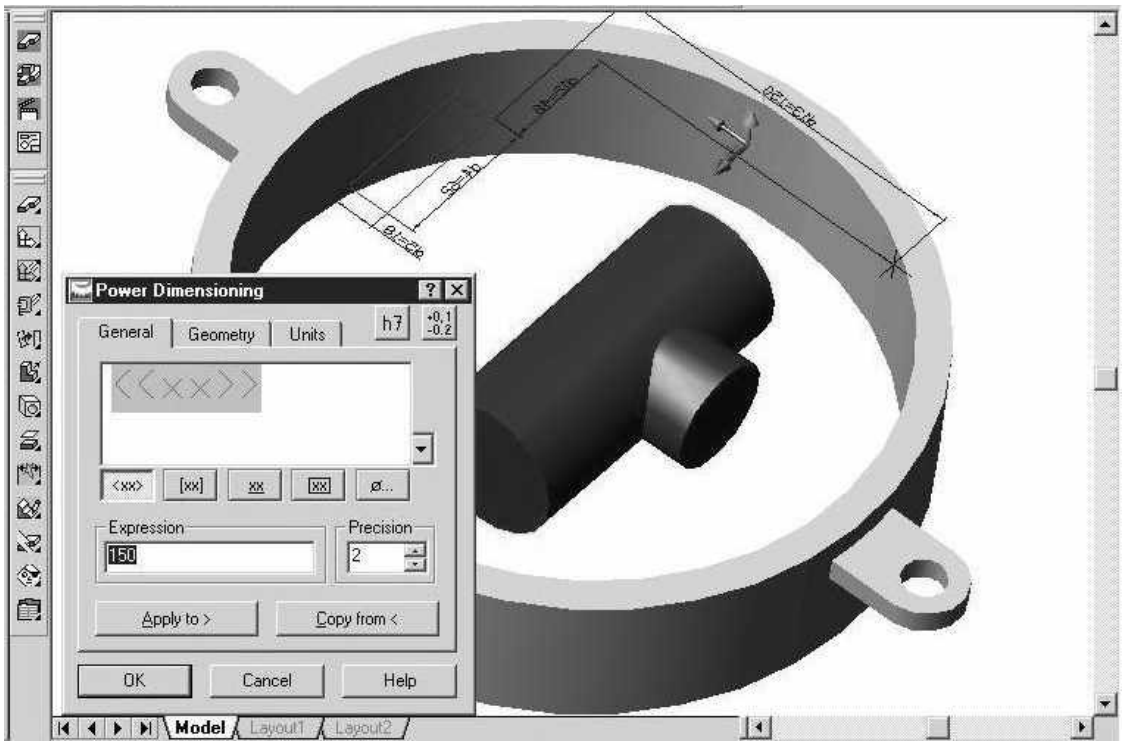


Figure. 5. Changing of the geometric levels of the model

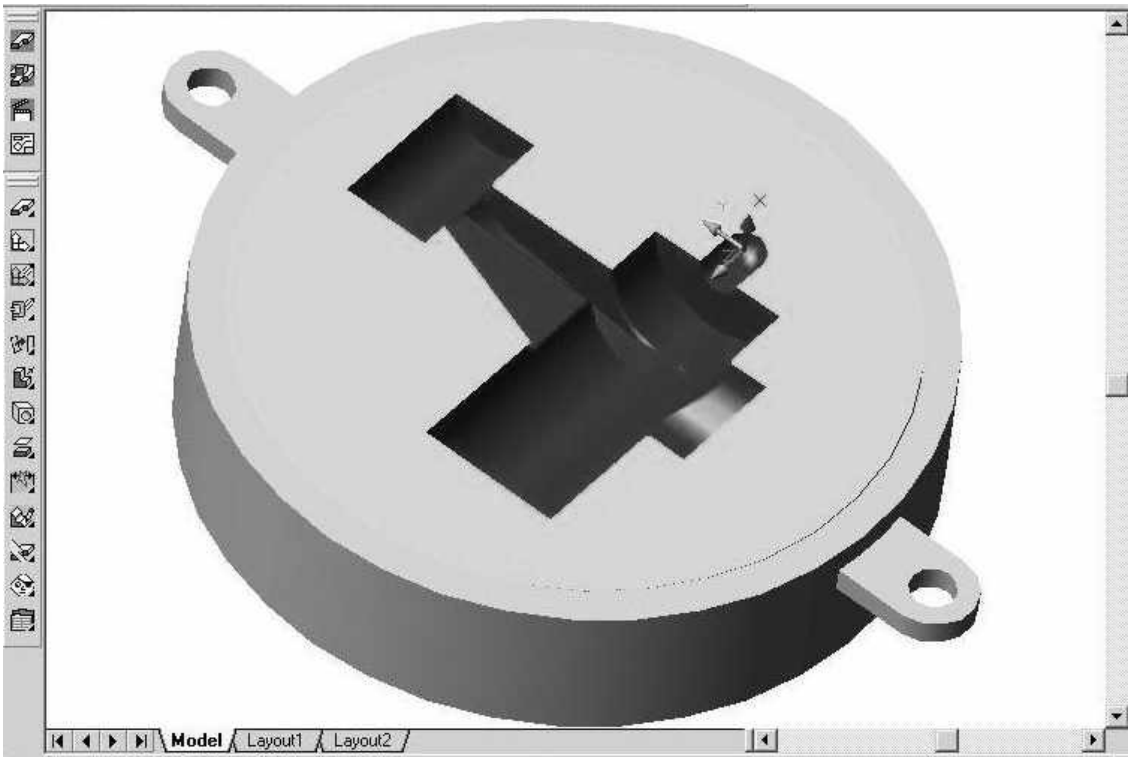


Figure 6. Changing of the casting form according to the new dimensions of the model

References

[1] **Autodesk** - *http://www.autodesk.com*.

[2] ******* - *Max CAD Magazine no.12 / 2003*, ISSN 1454 - 3559.

[3] **Goanță, A., M.** - *Grafică asistată în proiectarea constructiv tehnologică a semifabricatelor din fontă*. Editura Lux Libris, 2002.

[4] ******* - *http://www.ttech.ro/reviste.html*