

GROUP TECHNOLOGY TO SOLES DESIGN

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Abstract: *The use of injected plastic components has increased in recent years in most industries. As a result, the processes involved in the design and manufacture of injection molds gained significant attention due to complexity, the need for low cost and, especially, short-time manufacturing. The use of rapid prototyping techniques (Rapid Prototyping / Rapid Tooling) emerged as options for this sector, however the challenge is to ensure that plastic components resulting from these processes have physical and mechanical characteristics closer to those required in real applications. This paper explore the application of injection molds hybrids within the concept of Rapid Tooling, using alternative materials (metallic and polymeric), its components molding. An experimental hybrid injection molding, which use different materials in his male, was developed for the study of mechanical properties, chemical and dimensional pieces of polypropylene in injection on these materials. And also explore a deeper side, the implementation of Group Technology in the Design of soles for shoes.*

Key words: *Group Technology (GT); Classification; Part Coding; Functionality; Design Database*

1. INTRODUCTION

The mold industry has shown over the years a high ability to innovate and adapt to trends and change in terms of technologies, products and markets, promoting and dragging effects of structural development in other industrial sectors.

Are cited as key factors of competitiveness of this industry, quality assurance of the mold produced, the productivity levels of excellence which enable reduced production costs and capacity development, manufacture and assembly of the mold in terms increasingly reduced in an environment where changes dictated by the simultaneous development of the final product are becoming more frequent.

Families Shapes / Textures is a concept that could have a huge impact on the industry producing molds, especially in the reuse of templates, creating synergies to overcome the remaining barriers to increased productivity and reduced waste generation.

Due to high demand from customers in having their products to "yesterday" the major concern of manufacturers of footwear components is increasingly trying to improve the delivery time of your product. Industrial companies have been increasingly exposed to international competition. Globalization leads to industrial activity to the need to reduce costs and production times and increase productivity with greater respect for the eco-systems are not expected to reduce the strength of these requirements at least possible to foresee the future.

These two trends may create conflicting priorities, insofar as there may be a belief in business, environmental performance that is synonymous with the highest production costs, resulting in a reluctance to develop improvements beyond the minimum requirements imposed by mandatory regulation.

2. "GT" IN SOLES DESIGN

Group Technology (GT) has traditionally been a manufacturing philosophy in which parts are identified and grouped together to take advantage of their similarities in manufacturing and design. Similar parts are organized into families of parts. However, in the case of design, the use of GT has been limited in the standardization of parts and restoration of unique design. For example, a designer is faced with the task of developing a new piece and with this system can use a library to determine if a similar part already exists. A simple change in an existing part would be much less time consuming than designing from scratch. But that does not contribute to the design of innovative products in any way. However, the advent of the modern concept of functional reasoning in design provides an excellent opportunity for the exploration of techniques for classification GT. The idea behind designing a product is that, since the designer has been able to identify the intended function, it can expand it into sub-functions and then map these sub-functions with components capable of satisfying them. This thesis aims to fill the gap between the broad functional requirements (sub-function) and actual achievements (work parts) fulfilling these functions. It reinforces the GT classification of various parts, based on their functional applications. The classification gives designers an important resource for the selection of various parts of a product during the initial design stage. It extends the reach and usefulness of the GT with the coding part. Thus, the benefits which accrue from this classification are: to provide a database design, significant reduction in design time and effort by providing innovative design solutions, allowing maximum freedom of design, avoiding duplication of design and encourage standards to develop. The concepts underlying the development and implementation of the new system are being discussed in detail during the course of the thesis. (Fig. 1)

In my point of view, more effective than treating waste is to try to increase the life cycle of the mold, or try your order is delayed to the maximum. So this concept is to act early in the manufacturing process, namely the design of the soles. The designer will have in his possession a database component "families" GT, which try as a "puzzle" assemble your design. After this assembly, just pass them by mold (cavity), creating your product. These modular components may include various shapes and textures which allows an almost infinite versatility for the designer, not castrated so their creativity.

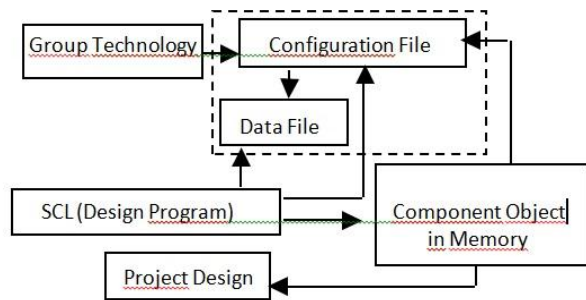


Fig. 1. Proposed SCL Design

With this work we contemplate the following parameters: different sizes (36-44), various shapes / textures. (Fig. 2,3,4)



Fig. 2. Example of Soles Mold

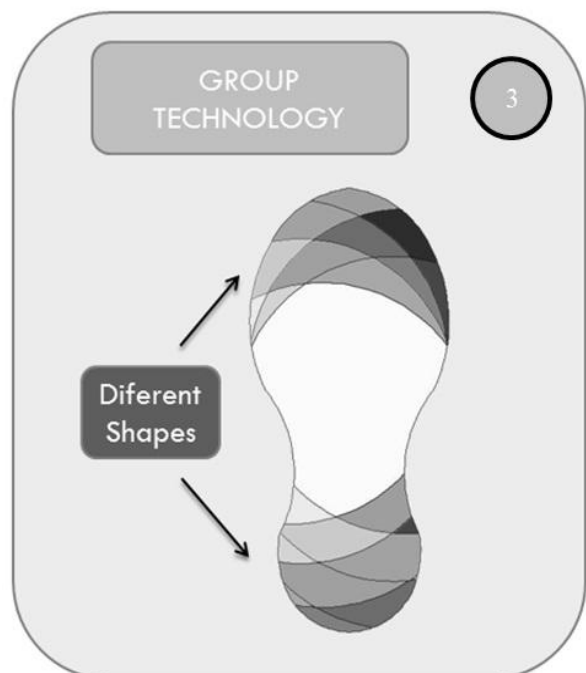


Fig. 3. Example of GT (Shapes) in Soles Design

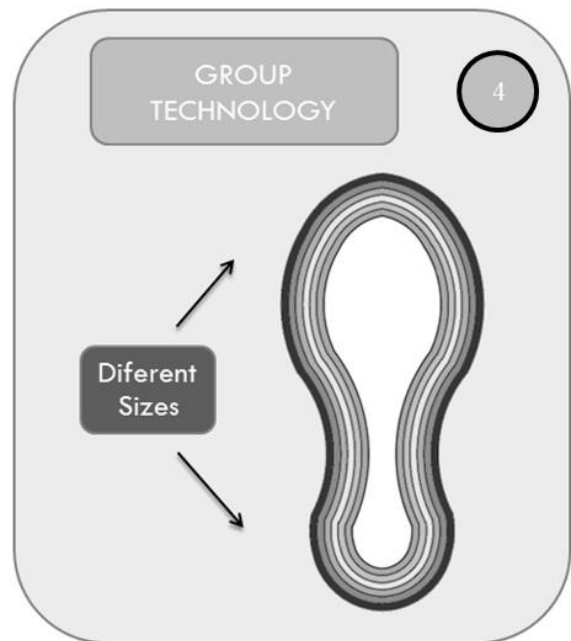


Fig. 4. Example of GT (Sizes) in Soles Design

3. CONCLUSION

Performing similar activities together, thus avoiding wasting time on the changes necessary to switch from one activity to another unrelated (manufacturing in the wake of two parts with similar characteristics reduces setup time between operations).

Standardizing similar and related activities, thereby focusing only on differences necessary and preventing duplication of efforts (reduction of variety of screws used); Storing and retrieving information efficiently, especially those related to a repeated problems, thus reducing the amount of search information as well as eliminating the need to solve a problem already solved again (using a new product, components of a existing one).

Realizing the above activities will be also reducing unnecessary proliferation of new items.

This paper can not be considered an end but a means to achieve a particular purpose. It becomes essential that companies make an assessment of technologies to find the best way to achieve their goals and what the most appropriate technology for each application.

4. REFERENCES

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