Abstract
The following research project has as main objective the conception and construction of an equipment for incremental sheet metal forming using a hydraulic system, which will allow to substitute the most common process with CNCs machines, that shows some limitations for not being specific designed for this process. The new system is hydraulic, controlled by a Programmable Logic Controller, responsible to insure its movement's accuracy. The project was developed at Mechanical Forming Laboratory, at Faculty of Mechanical Engineering, University of Campinas (UNICAMP).

Key words: Sheet Metal Forming, Automation, Hydraulics

Introduction
The incremental sheet metal forming process is a modern cold-stamping technology that has been used for shaping metallic and polymeric sheets, with CNC machines\(^1\). One of the biggest advantages of this process is the capability of forming various geometries on metal sheets in a fast and economic way, thanks to CNC versatility.

However, the most commonly found CNC machines don’t have enough degrees of freedom for forming several geometries required in their application areas, such as aviation and prototyping.

The main objective of this project is the design of a hydraulic system, supervised by a PLC Controller, to increase the number of possible shaping geometries and as a consequence to allow the incremental sheet metal forming be widely useful in different areas, without the necessity of modern CNC centers.

Results and Discussion
During the first months of the project the main focus was the strategy of the equipment's development, since its general working, such as the basic movements and mechanical assembly, to the sensors and programming system.

The next step was the search for an analytic model to describe all the forces involved in the incremental sheet metal forming process and, with this information, specify the size of hydraulic actuators and all other components used on the system.

The last part of the project was the mechanical assembly, PLC program, responsible for the actuators' movements, and finally, tests with the final machine to ascertain if the initial objective was accomplished.

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