

Parametric Macro for Two-Dimensional Cutting Stock in Optimal Processing System of FMS

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Abstract

In recent years, a number of successful nesting approaches have been developed by using the various heuristic algorithms, and due to their application potential several commercial CAD/CAM packages include a nesting module for solving the layout problem. Since a large portion of the complexity of the part nesting problem results from the overlapping computation, the geometric representation is one of the most important factors to reduce the complexity of the problem. The proposed part representation method can easily handle parts and raw materials with widely varying geometrical shape by using the redesigning modules. This considerably reduces the amount of processed data and consequently the run time of the computer. The aim of this research is to develop parametric macro for two-dimensional cutting stock on the Auto-CAD system. Therefore, this research can be called "pre-nesting".

1. Introduction

The material saving is one of the most important factors to be considered, and it is well known that a well-nested part layout can result in a substantial saving of the stock sheet. Although each industry requires different functional constraints due to its own characteristics, one common goal is to minimise the wastage of resource sheets by finding a most desirable layout of parts.

In recent years, a number of successful nesting approaches have been developed by using the various heuristic algorithms [Han & Na] [Daewoo], and due to their application potential several commercial CAD/CAM packages include a nesting module for solving the layout problem. However, many of the CAD/CAM system uses an interactive editing method, and most of them depend strongly on operators experiences to produce torch path

sequences for a nested stock sheet.

An important problem making the layout and the torch path planning difficult to handle is that the computation time required to obtain an optimal solution increases exponentially as the number of parts increases.

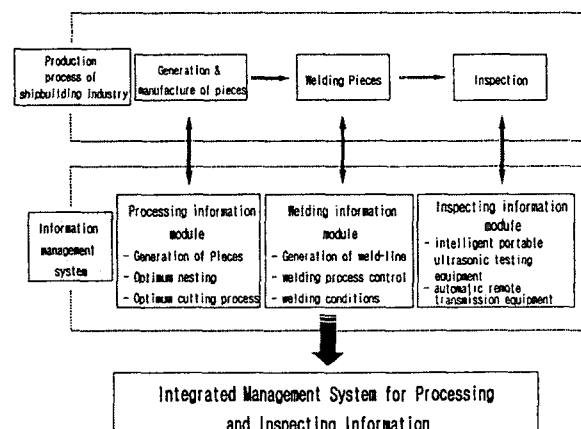


Figure 1. Schematic diagram of integrated management system

This paper is a part of research field which