Assembly theory to large part number assembly product : exemplified by the bicycle

黃家祚、鄧志堅

E-mail: 9900324@mail.dyu.edu.tw

ABSTRACT

The aim of this research is to study the feasibility to apply the assembly theory with a bicycle example. Previous researchers have been focused on the small parts product. In making a great advance, we tackle the problem of the large parts product, a bicycle, by modifying the former assembly theory. We have found that it is difficult to apply the former assembly method to analyze the assembly sequences of the bicycle. In that method, the computer could not search all the assembly sequences during the limited time, say one-week. In order to circumvent the difficulty, we use the cluster concept to the liaison diagram to reduce the size of the nodes and links in the diagram. Although using the clustering is a type of constraint, it is a common way to find the assembly sequences by the industrial. We found that there is a prerequisite to use the De Fazio and Whitney''s method, which cannot be used extensively in the practical assembly operations. It is necessary to modify the former method to fit in the practical assembly requirements.

Keywords : Liaison ; Unconnected part constrant ; Redundant Cycle ; Non-Redundant Cycle ; Spanning tree

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