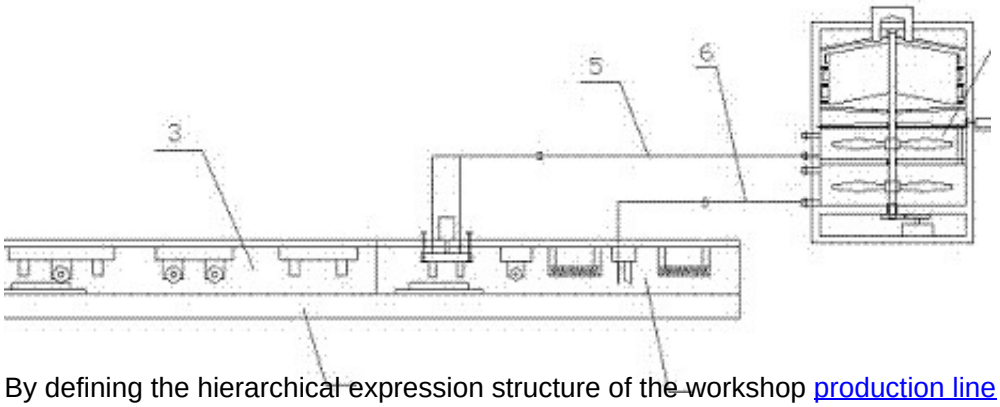
Research on integration technology of production line layout planning



By defining the hierarchical expression structure of the workshop production line model, the layout and logistics model of two-dimensional production line are planned in the CAD system, and the resource information description file is generated. Combining with the process rules and parts information as input, the three-dimensional production line simulation model can be quickly established and the simulation scheme can be evaluated. With this method, the efficiency of production line layout, logistics planning, modeling and simulation is improved.

Microwave drying mechanical equipment is a complex discrete manufacturing system with characteristics of dynamic and complexity. Using computer aided design, data are extracted and analyzed through the information data interface of enterprise's CAD/CAPP/CAM/PDM/ERP, and reasonable scheduling strategy is adopted to carry out facility layout and logistics simulation of workshop production line. Utilization rate of production equipment, production and waiting time of products and production line efficiency are obtained.

The performance parameters of production line are evaluated for bottleneck equipment and production line capacity, which provides reliable scientific basis for production line layout and production scheduling planning.Generally, the general CAD system is used to plan the resource models of processing equipment, transportation tools and workers in the workshop production line according to a certain topological relationship, and form a two-dimensional workshop production line layout map.

In the practical application of enterprises, AutoCAD software is mainly used to plan the layout of two-dimensional workshop facilities, draw the layout map of two-dimensional workshop production lines, and then according to the location distribution status of each resource model in the layout map, create a three-dimensional production line layout model in the manufacturing system simulation modeling software, and plan the logistics path. The simulation operation of the production system. The widely used commercial manufacturing system simulation modeling software is Quest, Are-na, Witness and so on.

There are many studies on production line layout planning and simulation modeling at home and abroad, but they are relatively isolated and lack of system integration from production line layout planning to logistics simulation. At present, there exists the problem of "isolated island" among production line layout planning, production information and simulation modeling system in CAD system.