

KNOWLEDGE-BASED DESIGN FOR MANUFACTURE

K. G. Swift, University of Hull

Kogan Page, 1987.

Contents

Preface 7

Chapter 1: Introduction 11

A problem, 11

Design for economic manufacture, 12

Product assembly, 13

Chapter 2: Design for automation in assembly

Introduction, 19

The automatic handling problem, 20

The product assembly problem, 23

Automatic assembly design aids, 29

Related research work in computer-based design for assembly, 34

Chapter 3: Design considerations for the consultation system 37

Introduction, 37

Design advice, 38

Justification of advice, 42

System updating, 43

Chapter 4: Computer-based methods for design advice

Introduction, 45

Conventional approach, 45

Knowledge-based expert systems, 46

Introduction to PROLOG, 55

Conclusions, 58

Chapter 5: A computer-based solution for automation in assembly

Introduction, 59

System knowledge, 61

Generalfeedingproblem, 62

Orientation of components, 64

Presentation problem, 66

Costing problem, 67

The system interpreter, 68

Chapter 6: Automation advice in CAD 85

Introduction, 85

The potential for a CAD interface, 86

Related research in CAD/CAM, 87

Determination of properties from drawings, 88

Communication of revisions by redrawing, 112

Implementanon of the CAD interface, 115

Chapter 7: System performance

Introduction, 121

Handling equipment costs, 121

Scale of the knowledge base, 127

Quality of design advice, 128

Consultation times and memory consumption, 128

Chapter 8: Prospects

Generaldiscussion, 131

Conclusions, 136

Future directions, 137

References and bibliography, 141

Index, 147