SYNTHESIS OF MECHANISMS

M. AKYURT
Professor of Mechanical Engineering
Faculty of Engineering
King Abdulaziz University

Scientific Publishing Centre
King Abdulaziz University
P.O. Box 1540, Jeddah 21441
Saudi Arabia

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Preface

In the name of Allah, the most Beneficent, the most Merciful. All praise is to Him, the One. And peace be upon His messenger, the trustworthy.

The first ground-breaking treatise on the *synthesis* of mechanisms and machinery, *Kinematische Getriebesynthese*, was authored by R. Beyer, and appeared in 1953. This was followed in the 1960's by *Getriebelehre-Maß-Bestimmung* by B. Dizioğlu and *Konstruktionslehre der Getriebe* by W. Lichtenheldt. These monographs were all based on geometry and graphical procedures.

There still appears to be a vacuum, as far as books on the subject of synthesis are concerned, in the English language. The concise and introductory works by Tao and Molian seem to follow the German school of thought. The more recent work by Sandor and Erdman, on the other hand, may be said to be moderately handicapped for being so numerical in nature.

The book in hand strives to harness the power heralded by computers in general, and by computer graphics in particular. Thus, classical techniques are bolstered with the speed, accuracy, and convenience afforded by modern computer techniques. Additionally, the *two-handled blocking concept* is introduced here, which possesses considerable potential as a versatile technique in the synthesis of plane mechanisms. Also included in the book is an introduction to numerical systhesis. The software package Al-Yaseer is utilized throughout to scrutinize the behaviour of the synthesized mechanisms. The appendices provide supplementary and review material

as well as full documentation, figures, and flow charts pertaining to Al-Yaseer. Answers to many problems are furnished at the end of the problem statement as Ans. Appendix D contains detailed solutions to some of the longer problems. The latter are marked as Ans. ☞. A *Quick Reference* utility is also supplied.

The book provides more than enough material for a single-semester, graduate-level course, allowing the instructor considerable freedom to select from among its topics. Parts of the book are also suitable for a more advanced course at the graduate level. Because of the emphasis on the down-to-earth approach to the solution of practical engineering design problems, this text is expected to be of interest to practicing design engineers as well.

The author wishes to express his appreciation to colleagues, referees, and his students, who have made valuable contributions during the development of this work by way of critiques, suggestions, or by providing general and software support. Special acknowledgement is due to Mr. F. Abdal Aal for invaluable editorial guidance. The author would like to thank SAVOLA for assistance during the camera-ready preparation of the book.

It is Allah Who bestows success.

Safar 1418 Mehmet Akyurt
Jeddah

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