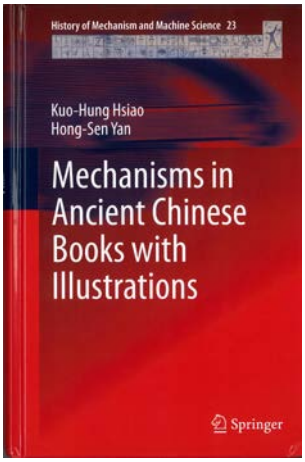
K.H. Hsiao, H.S. Yan

Mechanisms in Ancient Chinese Books with Illustrations

古中國書籍具插圖之機構

Springer, Netherlands, 2014.01
ISBN 978-3-319-02008-2, ISBN 978-3-319-02009-9 (eBook)



專書介紹

This book presents a unique approach to study mechanisms and machines with illustrations that were depicted confusedly in ancient Chinese books. The historical, cultural and technical backgrounds of the mechanisms are explained, and various mechanisms described and illustrated in ancient books are introduced. By utilizing the idea for the conceptual design of modern mechanisms, all feasible designs of ancient mechanisms with uncertain members and joints that meet the technical standards of the subjects' time periods are synthesized systematically. Ancient Chinese crossbows (original crossbow and repeating crossbows), textile mechanisms (silk-reeling mechanism, spinning mechanisms, and looms), and many other handiwork mechanisms are used as illustrated examples. Such an approach provides a logical tool for the reconstruction designs of ancient mechanisms with uncertain structures. It also provides an innovative direction for researchers to further identify the original structures of mechanisms and machines with illustrations in ancient literature. The book can be used as a textbook and/or supplemental reading material for courses related to history of ancient (Chinese) machinery and creative mechanism design for senior and graduate students.

古中國有不少具有機械圖畫的專書，記載各種巧妙發明與生產技術。這些古書提供後人了解當代的工藝技術水平，具有重要的研究與參考價值。然而，研究古書上的插圖機構時，常常會有不完整的文字敘述或者模糊不清的插圖表示等問題，有些插圖只能反映約略的機構構造，而機構的實際運動傳遞過程仍是不明確，使得讀者很難藉由古書中之實際真正了解古代工藝技術的發展。本書闡述一套獨特的方法，用於研究古中國專書之實際機構與機器繪製不明確的問題；首先探討古機構與機器的歷史背景與構造特性，並應用現代機構概念設計法及失傳古機械復原設計法，系統化合成出所有符合當代工藝技術水平的可行設計。本書的規劃與編排，可用於教學，也可用於自學，適用於大學部高年級生與研究生，在古(中國)機械史與創意機構設計的相關課程，做為教科書或補充教材。