Part II
Contact Geometry of Part Surfaces

Surfaces such as investigated in engineering geometry are designed and produced to interact either with the environment, or with other parts of a mechanism.

In the first case, namely when the surfaces are interacting with the environment (either with gas, air, or fluids, and so forth), they should be designed and produced so as to meet the requirements specified by gas dynamics and/or hydrodynamics criteria. Designing the surfaces of this particular kind is beyond of the scope of this book and thus is not considered here.

In the second case, part surfaces interact with working surfaces of other parts of a mechanism. Surfaces of this particular kind should be designed and produced to meet the requirements specified by conditions of interaction of the surfaces in a higher kinematic pair. In order to design part surfaces properly, the contact geometry of the interacting part surfaces needs to be thoroughly investigated and properly understood. An analytical description of contact geometry of the interacting part surfaces is helpful for this purpose.

In this part of the book, the contact geometry of two smooth regular part surfaces in the first order of tangency, or simply "*contact geometry of part surfaces*," is discussed in further detail.

Part II of the book is comprised of five chapters, namely:

Chapter 3 is titled "Early Works in the Field of Contact Geometry of Surfaces."

Chapter 4 is titled "An Analytical Method Based on the Second Fundamental Forms of Contacting Part Surfaces."

Chapter 5 is titled "Indicatrix of Conformity at Point of Contact of Two Smooth Regular Part Surfaces in the First Order of Tangency."

Chapter 6 is titled "'*Plücker Conoid*': More Characteristic Curves."

Chapter 7 is titled "Possible Kinds of Contact of Two Smooth Regular Part Surfaces in the First Order of Tangency."