CHAPTER 3

RESEARCH OBJECTIVES

The principal objectives of the research work described in this thesis were:

1. An experimental investigation of the effect of twist in the weft yarn on the mechanical properties of a series of Crepe-de-chine silk fabrics and objective evaluation of the series of commercially produced samples on KESF system.

2. The correlation between the extraction force and the mechanical properties of the laboratory made silk crepe-de-chine fabrics and a series of commercial silk fabrics.

3. Prediction of bending rigidity of silk fabrics by a theoretical model and also modification of the model postulated by Ning Pan for the prediction of extraction force.

4. Prediction of the extraction force by a mathematical model.

5. An investigation of the comfort characteristics of silk fabrics by thermolabo equipment.

Although Crepe-de-chine fabrics have been increasingly produced, there seems to be some doubt over the use of optimum twist which should be employed for weft yarns to confer optimum properties. Thus, the thrust of the thesis is to explore this area of research.
A survey of the literature on the low stress mechanical properties of the fabrics shows that a great deal of work has been done by the various research workers to assess the fabric quality by subjective and objective evaluation keeping in view the end use requirements of the fabric. The increased need for the satisfactory performance of the fabrics by the consumers and demand for the better performance of the fabric in the modern on line garment manufacturing technology has necessitated more fundamental research to be carried out to correlate the basic geometrical and physical properties of the fibres, yarns and fabrics to the mechanical properties.

An attempt has been made to suggest entirely a new method of characterising silk fabrics. The development of low cost instrumentation for characterisation of silk fabrics has formed an integral part of this study. For this purpose, a simple instrument has been designed to measure the handle of silk fabrics, and a correlation between this and the mechanical properties of fabrics has been made.

Although a theoretical model to predict initial modulus of plain woven fabrics was developed by Leaf and Kandil (1980), it was found that there was an error in their model. Subsequently, the model was modified by Leaf et al., (1993) and in their validation work, silk fabric was not included. The objective of the current work is to consider silk fabrics for the analysis of the model.