A novel method is available for the automated order-picking of goods that are packed in pouches. Pouches are produced and stored on a chain to simplify subsequent handling operations. In the order-picking zone, the chain is automatically fed forward by a cover band drive, cut into single pouches, and dispensed to fulfill customer orders. The approach is very promising but has not yet been put into practice since there is still a lack of rules for a proper dimensioning.

This thesis discusses the design aspects concerned with the new order-picking method. Detailed analytical, simulative, and experimental analyses are conducted and used to derive the missing tools for the dimensioning. The special loads that occur inside the pouch chain during the feed process are analyzed, a pouch test strategy that is applicable to any case of application is developed, and a mathematical model for the evaluation of pouch and pouch chain guidance design is derived. General design aspects of the cover band drive are discussed, and a simulation model is developed for the analysis and evaluation of the mechanics of and inside the drive. In particular, this model allows for the calculation of cover band pretension variations due to the inhomogeneous and compliant pouch chains which are affecting an undisturbed feed movement. A cover band test rig is developed and used to verify the dimensioning tools. Apart from this verification, further aspects, such as the positioning accuracy of the pouch cross seals for cutting, are analyzed experimentally. Recommendations for the dimensioning of a picking device are given. Based upon the key performance figures elaborated this way, design aspects regarding an entire picking system are examined. Eventually, an evaluation of the economic efficiency of the order-picking method in an example case is given.

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