METHOD AND APPARATUS FOR PACKETING OBJECTS IN A CHAIN OF BAGS

The present invention relates to a method of packeting objects in bags, wherein a chain of flat, flexible bags is conveyed through a filling station where the mouth of a bag is opened for insertion of an object. The invention also relates to an apparatus for performing the method.

In order to packet objects in bags it is advantageous to arrange the bags continuously in the form of a chain which is conveyed past a station where the bags are opened and the objects inserted, after which the bags can be sealed and separated from each other. The bags should preferably be made of flat, plastic film.

However, innumerable problems are entailed in such a method of packeting.

One of the main problems is how to open the bags in a reliable manner without the bags or the chain of bags being subjected to too much strain and without creasing.

Another problem is how to reliably hold or support the bags/chain of bags in conjunction with the opening and sealing process.

Said problems include the difficulty of permitting the front and rear edges of the bag to approach each other in the filling station.

Yet another problem is finding a simple way of varying the size of the bag, i.e. the dimension of the bags in longitudinal direction of the chain, or of working with bags of different sizes in one and the same packeting machine.

There is also the problem of being able to reliably and easily open the bags.

One object of the invention is to offer a method substantially eliminating or at least greatly reducing at least some of said problems.

This object is achieved by the method according to a first embodiment of the invention which substantially comprises using a chain of identically oriented flat bags, the bags being supported in the filling station via one lip of the opening along a section of the transfer track which is curved in a plane normal to the longitudinal axis or neck of the bag.

By inclusion of a curved section of transfer track in the filling station, along which one main surface of the flat bag moves, the shortest distance between the front and rear edges of the bag will be shorter than the length of the bag along the curved section of the transfer track. The bag aperture can then easily be opened by means of a jet of fluid, i.e. the free lip will be moved away from the secured lip. Such a fluid jet can be produced in conventional manner by an air nozzle. When an object has been inserted in the bag thus opened in the filling station, the following section of the transfer track may be substantially straight, whereupon the lips of the bag will be brought together, allowing the bag to be easily symmetrically sealed. An expert will understand that the sealing operation does not constitute any great problem.

The chain of bags may suitably be designed to cooperate with drive means transporting the chain along the transfer track. In this case the chain of bags may be provided with a series of perforations along the free edge of the one supported lip of the bags, spikes on the transport chain engaging in said perforations enabling the chain of bags to be supported and driven along a path defined by a guide for the chain.

If packeting is to be acceptable the orientation of the bags in relation to the direction of movement of the chain must be substantially constant. According to a simple embodiment of the method according to the invention the transfer track may be located in a single plane, e.g. a horizontal plane, in which case the two sections of the transfer track adjoining the curved section of transfer track will have different directions in this plane.

According to an alternative embodiment of the invention, where the direction of movement of the chain is such that the direction of movement of the bags in the plane of the chain of bags is constant, the chain of bags is arranged to be transported along a substantially straight track. The significance of this will be revealed in the following.

According to the alternative embodiment, said curved section of transfer track is also curved in a plane perpendicular to said normal plane and substantially encompasses the general direction of transport of the chain of bags. This means that the bags in the station are supported by one lip of the opening, along a support line which, seen in the general direction of travel of the chain of bags, diverges therefrom in two planes perpendicular to each other, encompassing the direction of travel. Assuming the bags are suspended in a vertical plane and are being transported horizontally, the support line will then form an S-bend in both vertical and horizontal plane.

As long as a single chain of bags of the type mentioned earlier is used, together with the transport means also mentioned earlier, the further development according to the invention will result in the general direction of travel for the bags being substantially straight. However, the following possibility is also offered and is exploited according to the preferred embodiment of the invention. Considerable advantages are thus obtained by duplicating the chain of bags so that figuratively speaking the chain is composed of "saddlebags" joined together, and by duplicating the further development according to the invention, i.e. by arranging two parallel, symmetrical "S"-shaped supporting lines. A first advantage is that no perforations or spiked transport chains or the like are required to support the chain of bags; the "duplicate" chain of bags will run symmetrically on the "duplicate" support lines.

A fundamental feature of the general inventive concept is that the curved section of transfer track permits bags of different lengths to be opened. This enables objects of varying length to be packeted in a chain without having to readjust the apparatus to open then bags.

Suitable starting material for the chain of bags might be flat, tubular film wound to form a roll, said tubular film having two central, parallel weldings running longitudinally, the upper layer of the tube being provided with longitudinal slits outside each longitudinal weld. Bags are then formed in the starting material, preferably in pairs opposite each other, by producing transverse welds in the outer edge portions of the material and separating between these transverse welds. Obviously the length, in longitudinal direction of the tubular material, of the bags thus formed can easily be varied. These bags of varying length can be opened in the filling station without difficulty and without readjusting the apparatus, providing the variation in length is kept within reasonable limits.