

HOSE PACKING MACHINE

This machine is used for packing hoses made of pressed rubber. It is a PLC-controlled machine and makes both electrical and pneumatic movements.

Operation principle

The pieces to be cartoned, are placed by the operator in a special hopper, which automatically loads the vibrator cup. The vibrator orients the pieces by arranging them in rows. Through the vibration the pieces are pushed up to the output channel of the vibrator, from which they are dragged out by a flat belt. They come out cadenced one by one and are moved to the control area. After the pieces position has been detected and memorized, the pieces are translated to the centre of the flat belt through a selection piston. The belt conveys them into the rotation device so that they can be oriented to the right position, after which the pieces are cartoned. At the end of the rotation the column block is lifted up to allow the pieces evacuation, onto the strap belt, which transports the pieces to the loading position on the tray. The pieces are tidily accumulated in rows and on reaching the pre-defined, programmed number for each flat row, they are made to fall through the opening (straddle) of the two straps into the special notch obtained in the tray.

At the end of each descent of the pieces the tray comes forward by one step and predisposes the next notch in the ready position to receive the new piece(s). The cycle is repeated for a programmed number of times until the first group of flat rows to be placed on the tray has been filled up.

After filling the first group the tray comes forward up to the point when the second group of transversal rows starts being filled. The filling is also performed according to the number of pieces and to the programmed and adjustable number of rows.

After filling the transversal rows the tray comes forward until it finds itself underneath the vertical axis, in the drawing position of the 1st group of plain rows. Then the vertical axis descends to the pieces grip point. It draws the pieces and performs a partial ascension, which is sufficient to lift the pieces from the tray, to allow the 90° rotation of the suction cup washer and to draw the group of pieces of the transversal rows, which - in the meanwhile - has been placed under the vertical axis by the tray. After the drawing the vertical axis makes a second partial ascension, which is sufficient to lift the pieces from the tray and allow the backward translation of the tray to the position where it can start a new cycle, while the vertical axis starts its descent to the box.

At the end of the descent the pieces are released and deposited onto the bottom of the box. Subsequently, the vertical axis makes its complete run upwards, after which the suction caps washer rotates 90° into the starting position for a new draw.

The cycles will follow one another until the box has been filled. At the end of the programmed number of shelves for each box, the box will be evacuated and a new empty box will be brought into the filling position, ready for a new cycle. The box filling cycles can follow one another up to completion of the production batch or up to the voluntary interruption of production.

The machine is composed of:

- a basement made of a steel section
- a hopper for the automatic loading of the vibrator
- a vibrator for orienting the pieces
- a vibrator lock device
- a belt for the pieces handling table
- a device cadencing the pieces output from the vibrator and controlling orientation
- a device for the 180° rotation of the pieces
- a column lock device for cadencing the strap belt loading
- a strap belt to move the pieces to the unloading area on the tray
- a device for the strap opening
- a linear electrical unit for moving the horizontal axis, tray
- a vacuum pump for sucking the pieces
- a system for the complete vacuum of the tank
- a pneumatical system
- a linear electrical unit for the movement of the vertical axis
- an empty box lock device
- a full box lock device
- a conveyor belt for the table to handle full and empty boxes.
- An electrical control panel