MANIPULATOR FOR AUTOMATICALLY EXTRACTING SMALL PRESSED MATTER FEEDHEADS FOR RUBBER MANUFACTURED ARTICLES

The MANIPULATOR is an electro-pneumatic unit to be used from time to time with vertical and horizontal compression and injection presses for removing feedheads or small pressed matter for rubber manufactured articles. The MANIPULATOR is composed of a basic, extremely solid structure, to which different tools can be easily fitted - with minimum overall dimensions -, which are normally used for extracting feedheads or for automatizing inserts loading operations and for extracting small pressed matter for rubber manufactured articles.

HANDLER USE ADVANTAGES:

- REDUCED THE TIME OF ITEMS REMOVE, because it's made at the same time for all the items and not one by one as in a manual removing cycle.
- REDUCED MANUAL LABOUR:cycles are completely automated and therefore one operator can control several machines.
- REDUCED OPEN MOULD TIME, then smaller moulds cooling and smaller vulcanization time.
- ELIMINATION OF UNDUE CYCLE STOPS and their pertinent problems due to moulds cooling down, such as scraps due to insufficient heating, moulds cleaning and eventual removing of them, purges for cleaning the nozzle from prevulcanized material.
- REDUCED MACHINE DOWN TIME: it is no longer necessary to wait for the operator to remove moulded items.
- IMPROVED QUALITY AND CONSISTENCY OF MOULDED ITEMS: continuous extractor cycles eliminate hazardous open machine down time due to operator absence and/or extraction speed, thus preventing the mould from cooling off and/or the compound from curing in the injection pot and extruder, which may change the physicalchemical properties of the moulded item.
- THEY PROVIDE A RAPID RETURN ON INVESTMENT.
- IMPROVED PLANT OPERATING TIME: simplifing the machine work load programming, it's really easier to programm, because of costant cycle times.
- MORE FLEXIBILITY: the handlers can be simply coupled to similar machines, compatible to their pertinent electric and pneumatic connections taps: they can be used on several similar moulds with small differences in tap positions.
- REDUCED MANUAL LABOUR DEDICATED TO ITEMS TRIMMING: the handlers use allows to remove and part automatically the moulded items burr straight through during the removing cycle.

1 General description of the machine

This machine is used for the extraction of feedheads or small pressed matter for rubber manufactured articles in vertical presses and presses that are compatible with it. This machine is provided with PLC-controlled, electrical and pneumatic handling, and is composed of a group for the horizontal movement and a group for the vertical movement of mechanical hands. The group for the vertical movement runs in a bar with vertical slides, which is connected with the tubular base, in which the pneumatic valves block is located.
The framework is subdivided into three areas:

- A rear area for the slide bar running of the horizontal axis and the relative cable-holding chain
- A central area for the horizontal axis running with the relative cable-holding chain and the vertical movement axis
- A front area for unloading feedheads or small pressed matter of rubber manufactured articles that have been extracted from the mechanical hand.

At the end of a certain number of pre-defined, adjustable cycles the container located in the unloading opening and in which feedheads or small pressed matter of rubber manufactured articles that have been extracted have been deposited can be removed and replaced with an empty container.
The container replacement operation is carried out by opening the mobile gate located on one of the press sides, on which the manipulator is located.
The whole perimeter of the manipulator is closed by means of a series of panels fixed in the tubolar profile slot. The front side is provided with two mobile protections to favour the unloading and container replacement operations, as well as the adjustment of pneumatic valves, while the left side is open and must rigidly lean onto the press, from which the feedheads or the small pressed matter of rubber manufactured articles are to be drawn. The manipulator is pre-disposed so as to allow a conveyor belt to be fitted in, which consents to evacuate feedheads, burr o pressed pieces, as an alternative to drawing through the container.

The machine is composed of:
- An electrical linear unit for the horizontal movement of mechanical hands
- A pneumatic linear unit for the vertical movement of the horizontal axis and mechanical hands
- A unit with a mechanical hand for extracting feedheads or small pressed matter of rubber manufactured articles

- A device provided with a photocell to check if the extraction of the feedheads/pressed matter have been carried out
- An electrical control panel with PLC control, selectors and buttons
- A pneumatic system
- A front side gate
- A front area, which will have to be closed by the press presence

2 Description of the operation principle

The manipulator approaches with its front side open to one of the free sides of the press, normally its rear or side part.
After the vulcanization (reticulation) time has elapsed the press opens vertically.
At the end of the opening run, with closed protections and the press front gate open, and only in case of extraction on the front side of the press (for extraction on other sides the front mobile gate of the press must be closed) the manipulator, after checking that the pieces previously extracted have been ejected, enters into the press tables and - with a vertical movement - approaches the mould at the gripping point. At the end of the vertical movement the pliers close.

After gripping and after the programmed, adjustable pause time has elapsed the manipulator makes a vertical movement for stripping the feedheads or the pressed matter. At the end of the vertical stripping run the manipulator make a horizontal movement to allow the arm to exit for a programmed, adjustable run. During the arm exit operation the feedheads, the burr or the small pressed matter of manufactured articles are stripped from the mould.
During the exit of the manipulator by means of a sensor the presence of the feedheads, the burr or the small pressed matter of manufactured articles in the pliers is checked.
At the end of the horizontal run the piece-pliers open for a programmed, adjustable time.
After the pliers opening time has elapsed the feedheads, the burr or the small pressed matter that have been extracted fall into a special container located in the unloading area or onto the conveyor belt and the manipulator is ready to carry out a new extraction cycle at the next press opening.
At the end of a previously programmed, adjustable cycle, the acoustic and luminous indicators indicate the operator that the evacuation of the feedheads, the burr or the small pressed matter can be carried out.. This operation can be carried out only when the press is open, the manipulator is at a standstill, and the message on the display indicate the container change and the light-blue lamp located in the reset button is switched on.