

**Automatic storage ("intake") in containers and feed ("output")
of tubes, pipes, rods and parts for further processing => fast and cost effective**

Operating mode of the ,input' and ,output' unit

The work pieces, e. g. from a cutting machine are automatically fed into the storage unit.

Belts receive the workpiece. The belts automatically lower with increased filling. The workpieces are put gently on top of each other and thus use the smallest possible space inside the container.

An intermediate buffer allows for a continuous intake of workpieces. The workpieces are automatically taken by the magazine containers. After having been filled the magazine containers can be relocated to another place for feeding to an output unit.

By automatically lifting the belts the workpieces are transported out of the magazine. The built-in separation unit as well as a handling device or robot provide for an automatic transfer of the workpieces to a processing machine.

Intake and output units are installed stationary at the respective location. The magazine containers are transported from the intake to the output units. Thus an intermediate storage of workpieces in a quantity as required for a continuous production can be realized.

Advantages

- * Stand-alone regulation of the output speed as per the cycle time of the following production step
- * Automatic signal 'full : empty'
- * **Speed > fast and cost effective**

Loading

- * sorted storage - reduced space needed
- * careful piece handling - intermediate storage as per process needs

Unloading

- * easy extraction - reduced expenditure of time
- * user friendly - reduced cost for personnel
- * fully automatic transfer

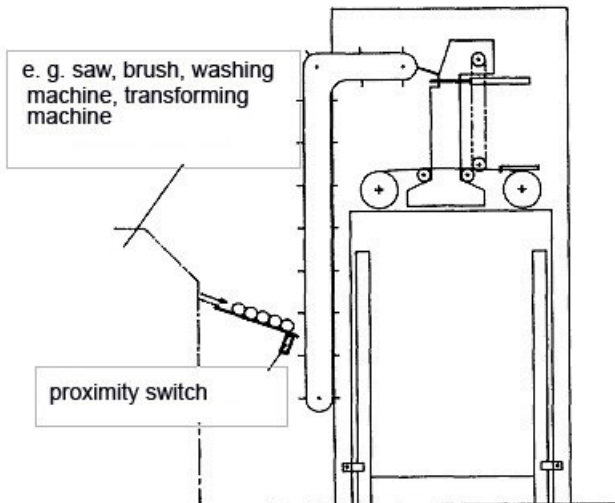
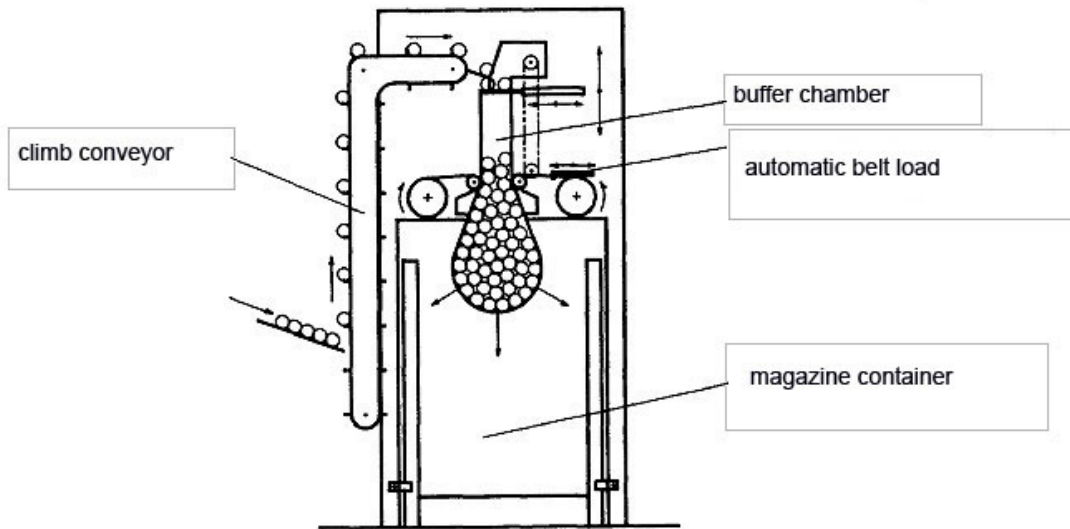
Further advantages of the system

- * economic batch sizes already with small quantities e. g. 250 pieces
- * savings due to less machine-use, improved work flow, less rejections

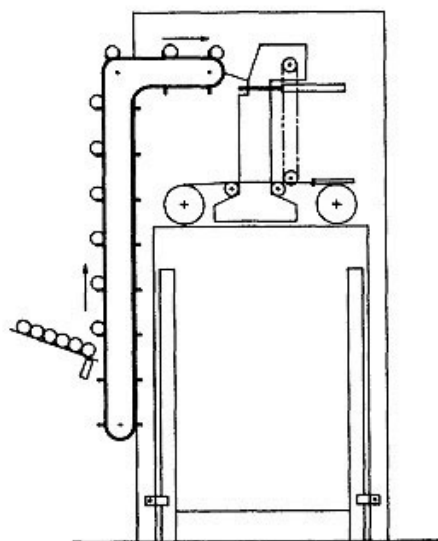
Tube-/Pipe-/Part- dimensions

- * diameters from 10 to 100 mm
- * lengths from 150 to 3000 mm

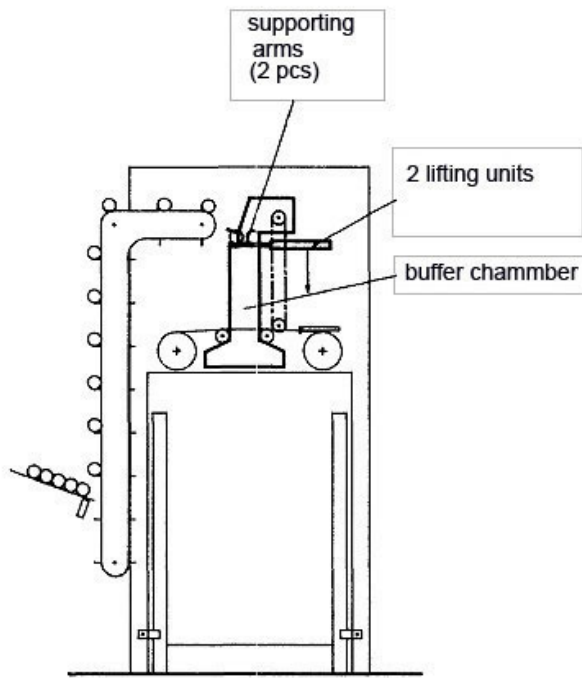
1. Description of operation - input unit



(1.1) The proximity switch recognizes tubes placed before the climb conveyor



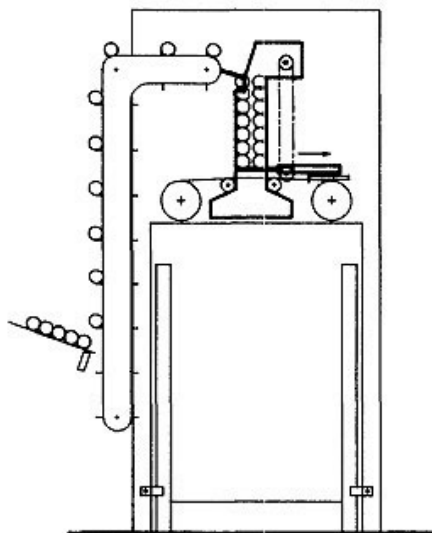
(1.2) The climb conveyor starts its operation and transports the tubes to the buffer chamber
Remark:
Minimum space requirement of the climb conveyor due to the vertical-horizontal arrangement



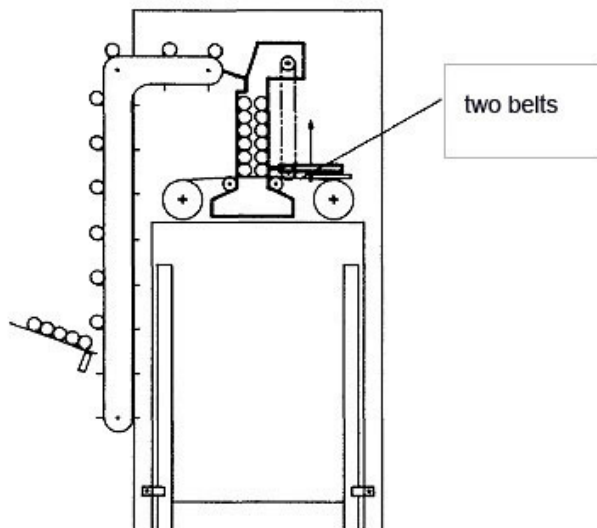
(1.3) The buffer chamber picks the tubes. After the first layer of tubes is placed on the supporting arms, they are lowered. Lowering is controlled by a photo-electric cell acc. to operation and tube diameter.

Advantages:

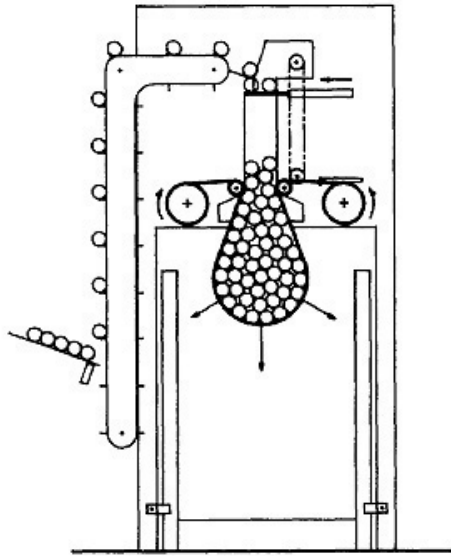
- gentle placing of tubes
- additional noise reduction
- While lowering the lifting units the magazine containers may be exchanged



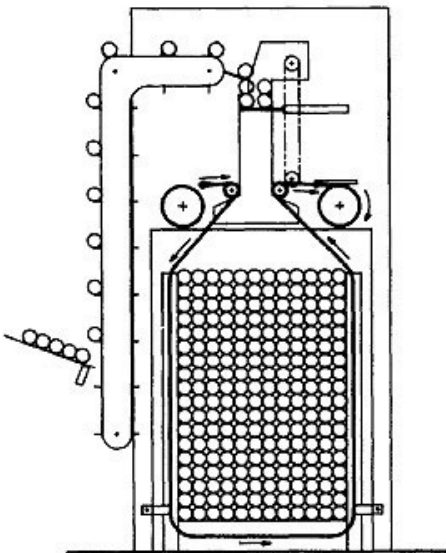
(1.4) The supporting arms reverse after the lifting units have reached the lowest position



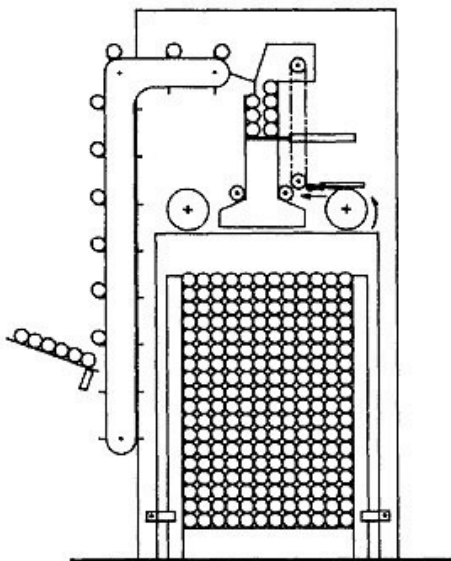
(1.5) The tubes are placed on the belts now. The lifting units go upwards into their home position



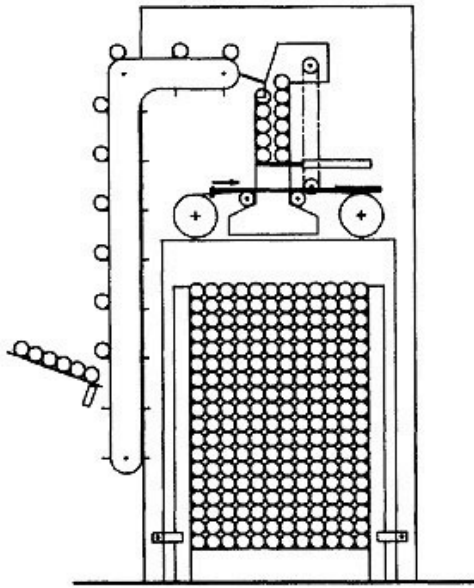
(1.6) The belts lower down. The supporting arms take over new tubes / parts.
The buffer cycle starts anew until the magazine container is filled or the quantity required is reached.



(1.7) The magazine container is filled.
The belts are unhinged automatically and wound back.



(1.8) The automatic belt load hinges the belts again.



(1.9) The belts are loaded. The belt threads drives back.

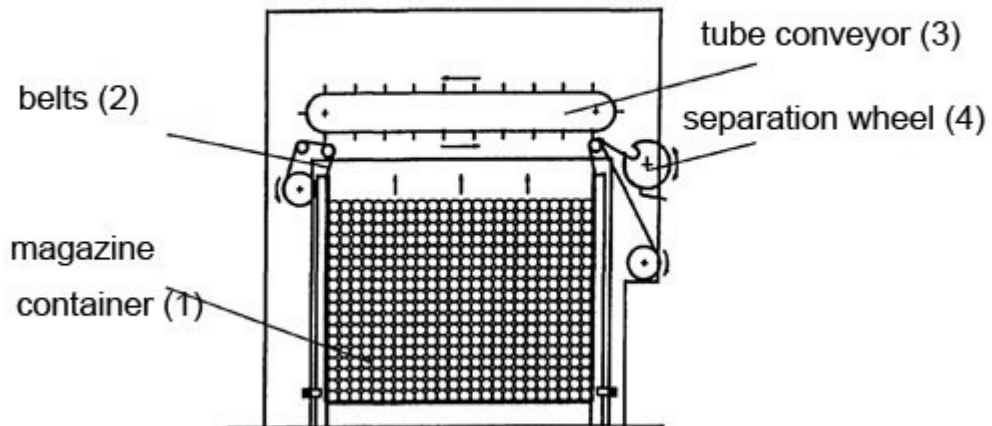
Remark:

During the operations (1.7) to (1.9) the magazine station still can take tubes / parts into the buffer chamber. There is no stand-still of upstream production machines !

Now follows the change of the magazine container.

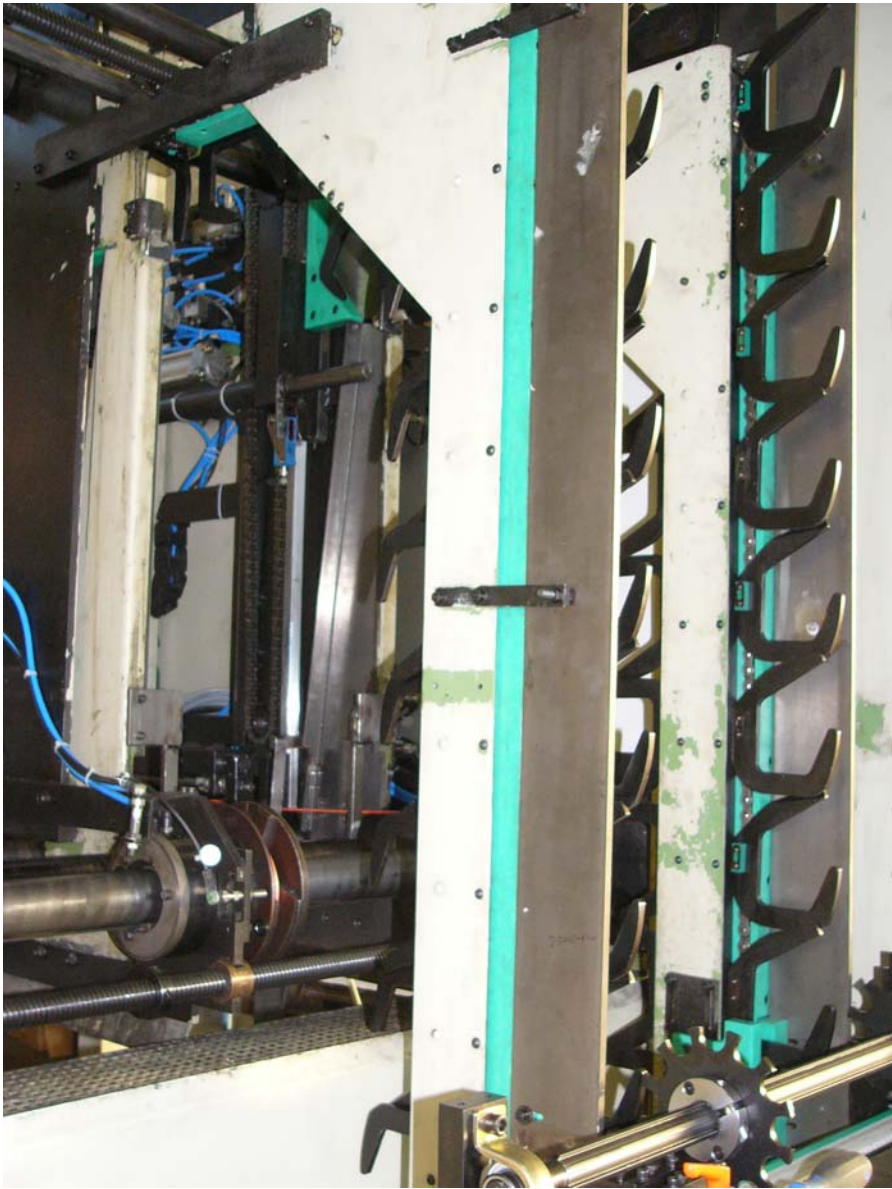
Thereafter the cycle starts again at (1.4)

Description of operation - output unit





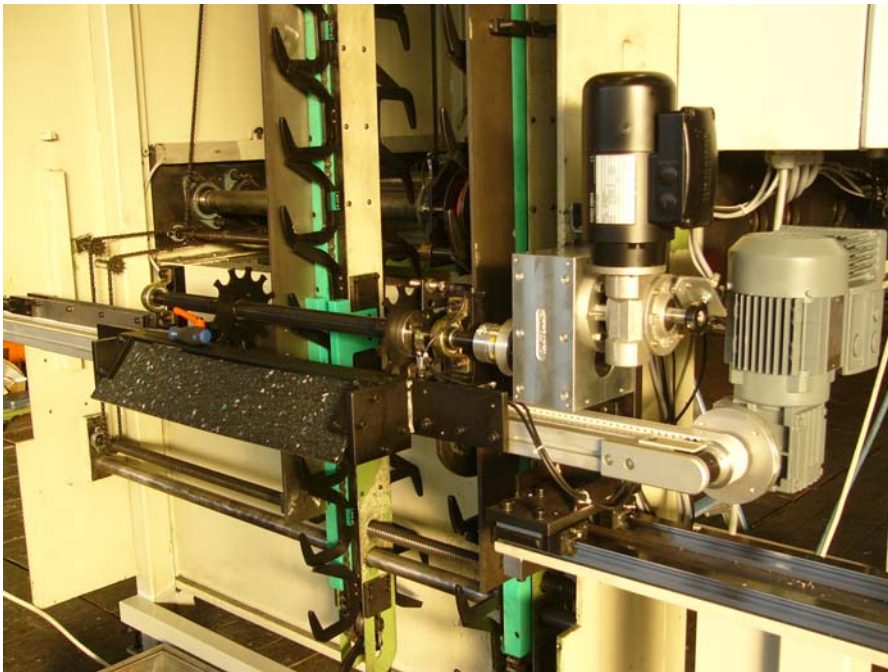
Input unit with supplying belt



Input unit with climb conveyor



Input unit with
buffer chamber
and supporting
arms



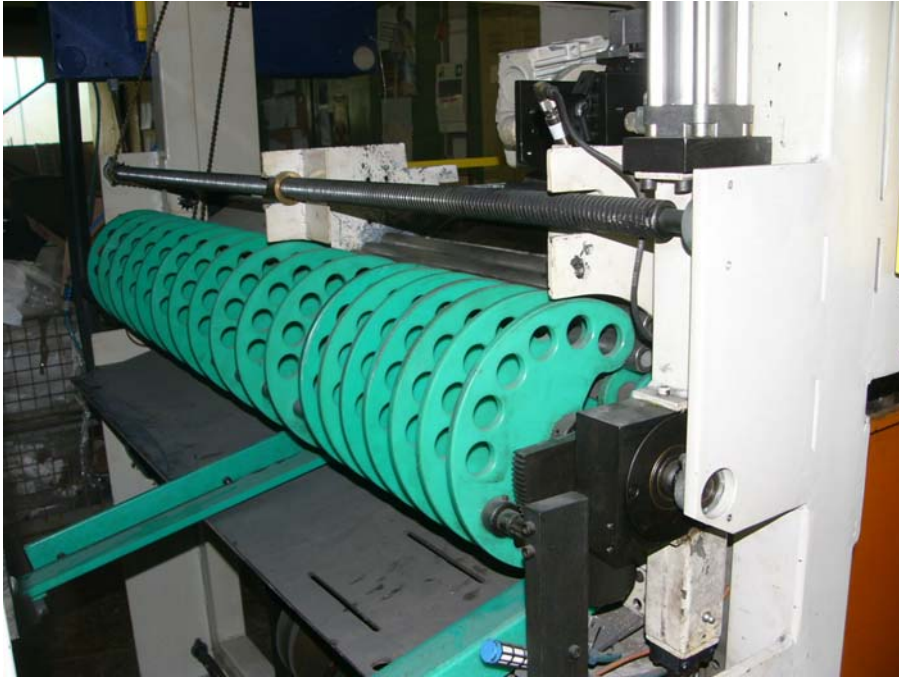
input unit with
supplying belt



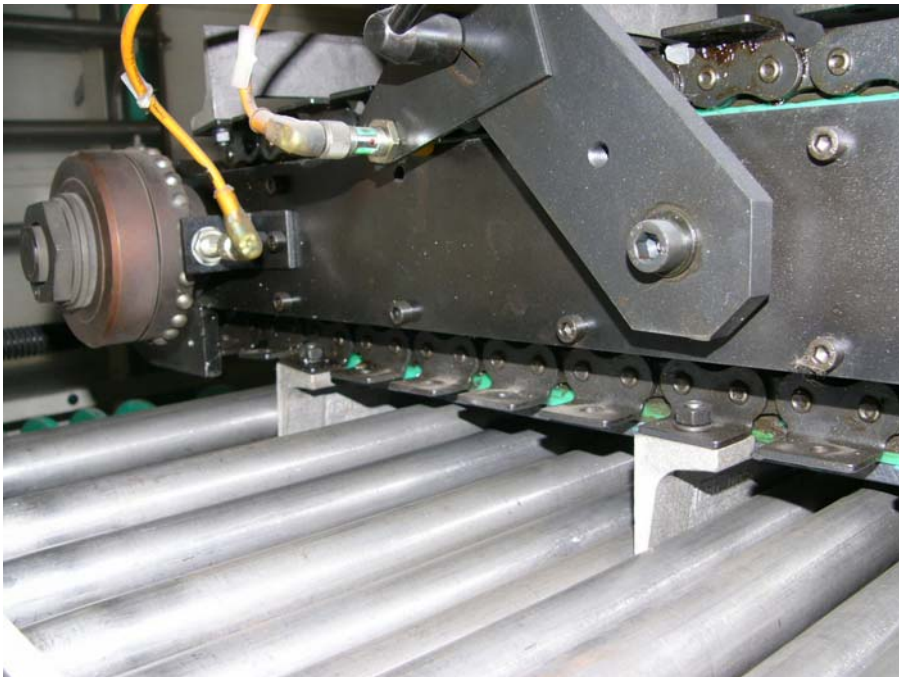
output unit with de-
burring station and
magazine container



output unit



Stepless adjustable tube separator at the output unit



tube / pipe conveyor at the output unit



Tube / pipe
conveyor at the
output unit