SECTION 1

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SECTION 2.

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TECHNICAL DOCUMENTS

1313-T PACKAGE SPRING MACHINE TECHNICAL CHARACTERISTIC

- Spiral machine for package spring manufacturing
- Full automatic operation system
- Spring cooling system
- Easy and fast spring size change
- Spring heating system with no fault with electronic control
- Ultrasonic welding
- Automatic spring opening arm
- Full noise isolation and safety
- Automatic cutting unit

TECHNICAL CHARACTERISTICS

Speed	74 springs/minute Max.
Dia. of wire	1.4 - 2.0 mm
Operation Mode	Continuous or cutting with clearance
Welding Unit	Ultrasonic system
Control	Movement control, PLC control, frequency inverters control panel
Max. wire weight	1000 kg
Spring Height	100-210 mm
Dia. of wire	900 mm
Type of spring	Barrel, cylindrical
Speed control	3x servo motor
Motor	1x servo motor
Winding motor power	1.1 Kw
Heating Transformer control	Electronical switching
Network	380 V 3Faz 50 Hz.
Power	18 KW.
Net Weight	4321 Kg.
Gross weight	5363 Kg.

SAFETY RULES AND WARNINGS

ELECTRIC HAZARD:
To open the machine's electrical panel, the connection boxes on the machine, to connect the cables, to change, first the electricity input of the machine should be cut off. All types of electrical repair and maintenance processes should be carried by technical personnel.

HIGH HEAT:
During the heating process of the wires, the heat of the wire increases up to 300 degrees. The spring should cool on the conveyor before it reaches the textile. During this time touching the wire can cause serious burns.

PRESSING HAZARD:
During the processes such as the adjustment, or change of parts in the spring pressing group in the cabin, moving parts should be taken care of. If not, these may cause permanent damage on the hands.

PROTECTING HANDS FROM HEAT:
If required to touch tempered springs while they are hot, gloves should be worn to prevent burns on the hands.

MOVING PARTS WARNING:
Some parts of the machine that gain momentum from servo-parts may move intermittently. These intermittent movements should be observed closely and these parts should not be interfered with before stopping the machine.

WARNING DURING USE:
Before every work to be done in the sections with warning, operating manual related to these parts should be read and the warnings and notices should be followed with care.

ADJUSTMENT AND MAINTENANCE WARNING:
During the operation of the machine, no actions consisting of risks such as adjustment, maintenance should be carried.

PROTECTION WARNING:
Cabin safety switches should never be disabled, machine should not be operated with the protected covers, cabin doors and winding protectors left open.

- If parts changes are required due to malfunction or wear, in the machinery, parts approved by the manufacturing company should be used.
- No changes should ever be made on the machine's general operation system. Otherwise the safety and protection systems will become inoperative.
- The switches of the electric section and cabinet doors should only be kept by the authorized maintenance and repair personnel.
- When the machine is stopped for reasons such as malfunction or maintenance, before starting repair, necessary warning signs should be placed o the machine and electrical panel, general electrical switch and air input valve should be locked under required conditions.
- During wire loading on the winder, instructions for use should strictly be followed.
- During changing of the textile hot melt gun should be used with care, and care should be taken not to allow it to touch hands. If not, it may cause burns on the hands.

TRANSPORTATION AND STORAGE:

1313-T Since the package spring machine is of modular structure, during transportation it should be disassembled and delivered in three wooden boxes.
After the disassembly process during delivery, in order to prevent corrosion, machinery parts should be lubricated with protective grease, and covered with stretch film. To prevent oxidation of electric panels materials removing humidity are used.

Wooden boxes should be carried with forklift by paying attention to their weight of gravity. During lifting with the forklift, care should be taken not to approach the boxes closer than a safe distance.
Manufacturer Company should immediately be informed off events such as dropping, breaking that can occur during transportation and cause damages and the instructions given should be followed.
In long time storage excluding the transportation, closed areas not affected by natural circumstances should be preferred; the boxes should be kept closed.

1313-T POCKET SPRING MACHINE

1313-T Pocket Spring Machine is a fully automatic pocket spring machine. Steel wire is used to make spring which is loaded in a basket and hardened heating with electric current. These springs are manufactured in spring bands putting into pockets made out of nonwoven material supplied as rolls.

The Machine is composed of following main parts;

1. Wire reel
2. Fabric reel
3. Spring body
4. Turret
5. Cooling conveyor
6. Crashing and transfer
7. Fabric table
8. Cabin
9. Electric switchboard
10. Cutting unit (Optional)

WIRE FEEDER UNIT

Commercial form of steel wires used in bed industry is dispatched in cardboard hub or in basket of 1000 kg weight approximately. This wire feeding unit was designed to feed the wire to the machine smoothly which is integrated with the machine. Carrying basket must be installed on the machine in order to load the wire to this reel. The basket provided with the machine is used for cardboard hub bundles. Wire basket must be loaded to the reel using a forklift.

Open the door of reel, remove sheet ring on the wire table and lower the basket emptied to load wire basket.

If it is the first time to load wire, check centering stand on the table, fix them if not fixed and adjust the opening aligned with the basket hub. In case of absence of centering stands the basket may damage the machine and surrounding area flying while the reel is rotating!

In the event centering stands are unadjusted; the basket may damage reel reducer located under wire table rotating eccentric!

After the sheet rings of the bundle put into the basket are removed, the basket is put on the wire table slowly removing the basket using forklift. It must be paid attention to not impact the table while doing this.

Sheet ring is installed around the basket, otherwise the wires loosen and coils to balance wheels dropping down during the basket rotate.

Edge of the wire on the basket is cut properly and the edge is attached into rings of the switch. This switch ensures the machine stop when the wire is exhausted from the basket.
Together with this operation, the reel is enabled to rotate by hand pressing the forward button on the elevator pole to get wire from basket while fixing the wire. When the wire is needed to rewind for any reason, backward button must be used and no wire must be skipped on the basket.

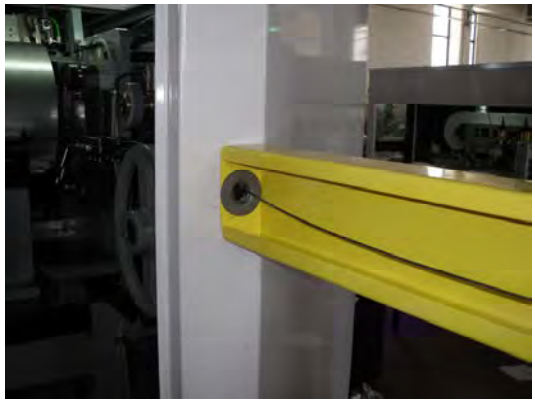
The wire passing through the passage ring on wire housing leaves the reel unit passing wire elevator pulleys respectively. Reel door is closed and the machine becomes ready to work. (It is recommended to pass the wire through cleaning sponges installed in protective sheet prior to enter cabin section; otherwise foreign particles on the wire may cause dirt and wearing on the machine.)

Safety systems installed on the wire reel are;
Reel door safety: Stops the machine in the event the door opened during rotation of wire basket.

Elevator upper limit switch: Elevator stops the machine pressing this switch in the event that the reel comes short of wire for any reason during the machine runs.

Wire edge safety: The machine stops by this switch in order to prevent the edge of wire damage surrounding by impact.

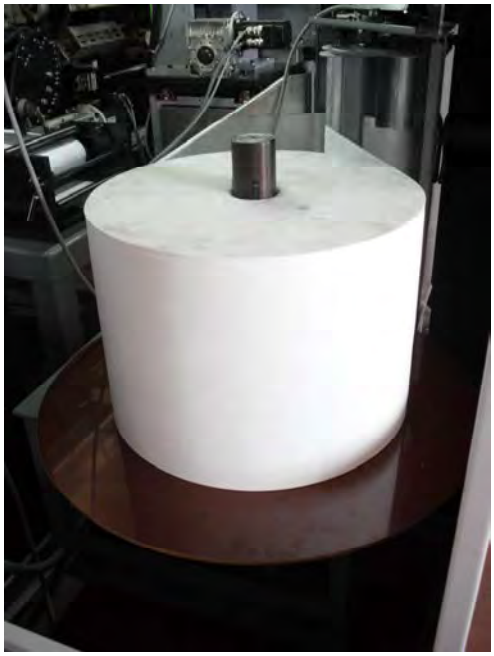
None of the safety systems installed on the machine must be disabled for the safety of machine and employees.



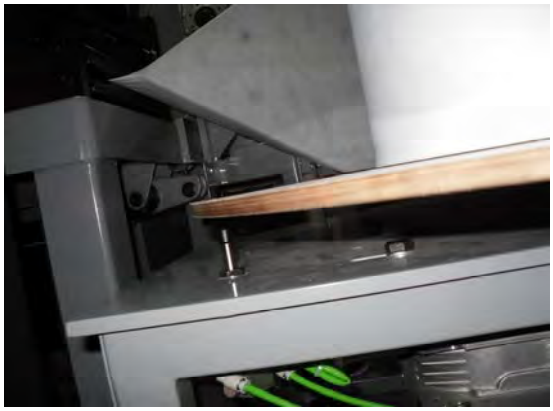
FABRIC FEEDER UNIT

Another raw material used by pocket wring machine is the fabric forming bags. Since the fabric is welded by ultrasonic welding, the fabric must contain 40% PP. Fabric manufactured as nonwoven are manufactured in rolls of 85 cm diameter, and width thereof is elected depending on the pocket spring manufactured.

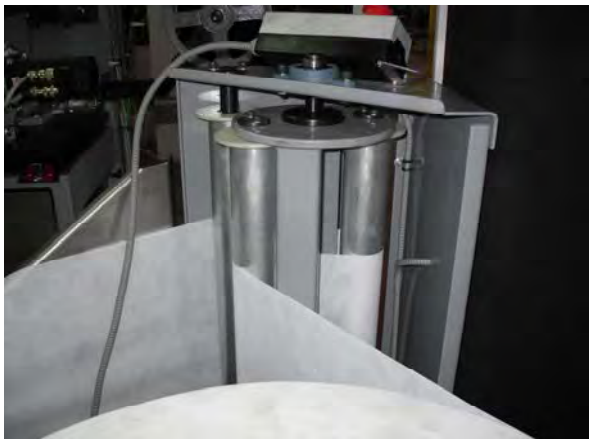
Fabric feeder is designed to feed fabric to fabric table folding to form a pocket shape. Fabric roll is slapped on air shaft enabling the roll opens in counterclockwise.

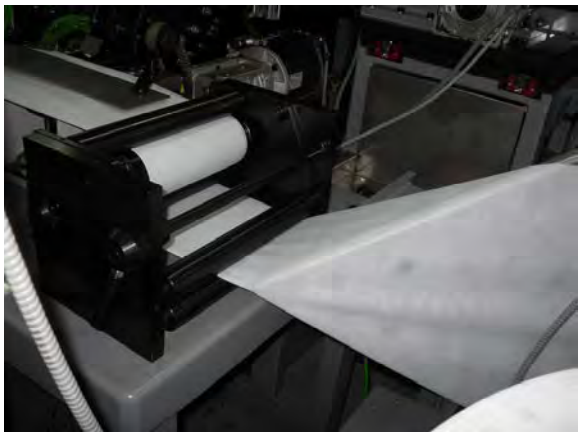


The roll is fixed to the shaft using hand controlled valve. If there is fabric remained from previous operations new fabric is fixed on to old fabric with a hotmelt gun.



The machine is run with a lower speed to enable fabric pass through the machine without rupture. Machine normal speed is resumed after the edge of fabric reach to machine output. If the machine is being installed a new fabric; edge of the fabric is fed to fabric triangle over fixed cylinder through dancer cylinders.



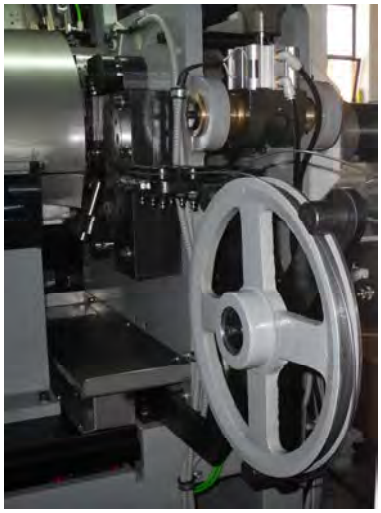


The fabric folded here passes through feeder group of cylinders. The clamp lever is used to enable feeder drive fabric. There are two settings on the fabric reel.

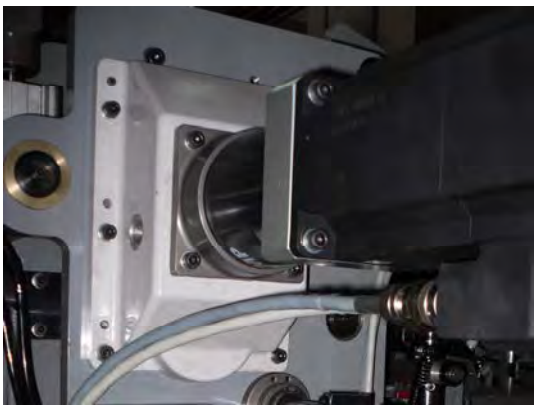
Fabric roll height adjustment: Fabric roll may be moved up and down using two buttons precisely. This enables to align edges of the fabric folded in two.

Fabric tension adjustment: Dancer group is stretched by air cylinder to prevent the fabric loosen which is taken step by step. Single sided air pressure applied to the cylinder is adjusted by a regulator.

SPRING UNIT



This part consists of the part the wire takes spring shape coming out of wire reel. Servomotors running with electronic eccentric are used to shape springs to enable manufactured springs are smooth and exactly same. Following three parameters forms a basis for spring production:



1. Wire length

In order to enable the spring desired to become correct shape, quantity of the wire used for the spring must be compatible. Roughly wire length calculation may be estimated as (wire diameter x 3,14 x number of nodes). Wire length must be entered to control panel together with all other parameters in mm.

2. Form

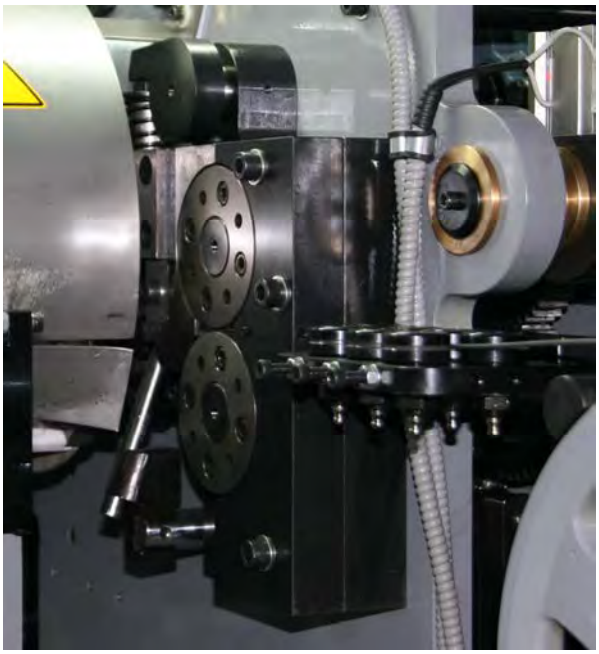
This axis called as form axis is the one determining circular form of the spring. The system driven by the screw rod connected to servo motor shapes the spring as desired through form pulley depending on the values entered in eccentric table.

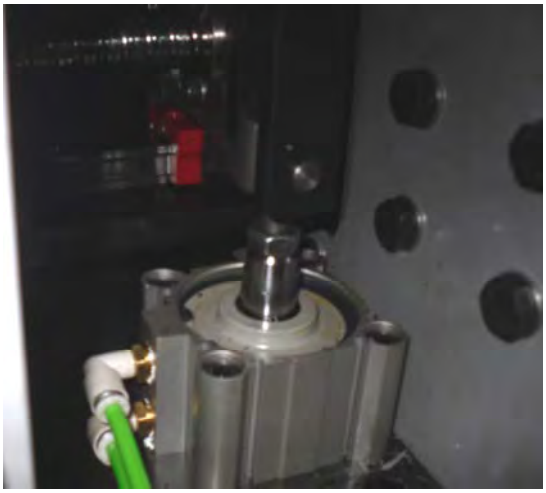
3. Pitch

This axis called as itch axis ensures to adjust spring length determining pitch intervals of the spring. Pitch intervals are increased by pitch rod depending on the values entered in eccentric table.

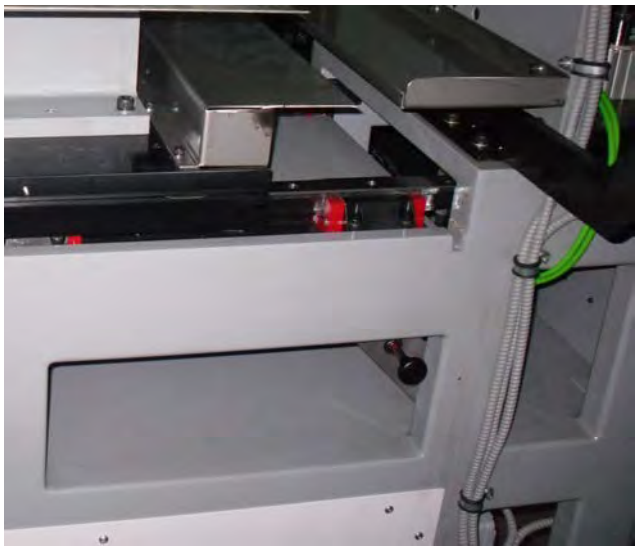
There are wheels and wire input pulleys preventing the wire swivel over spring body except for these three main elements. Necessary adjustments must be made to enable moving pulleys press on the wire located in the front when wire diameter changes.

Wire driving and cutting operations on spring body are collected in a group called vals group. Important parts such as wire feeding pulleys, pins, beds, cutting pipe, cutting blade and carrying pin are located on this group.



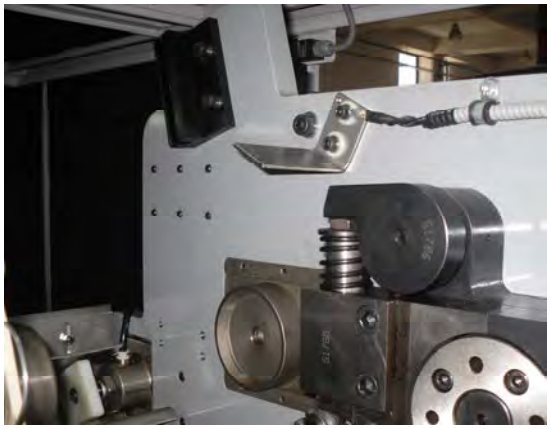


The wire passed through the pulleys is fed under form pulley passing through cutting pipe and wire drawing pulleys. In order to get wire pass through wire drawing pulleys, the opening is ensured to get wider closing press cylinder using hand controlled valve under spring body.

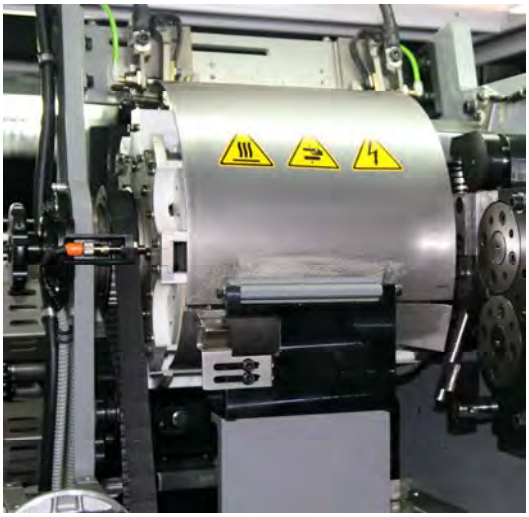


After the wire passes, the valve opens again and the pulley is ensured to grasp the wire. Air pressure applied to the press cylinder should be adjusted so as not to cause the wire crashes. Low air pressure causes the pulleys slide the wire while feeding.

Cutting operation is carried out by carbide blade located in cutting pipe opening. Cutting blade moved by two stage cutting arm driven by pneumatic piston cuts the wire with scissor movement of cutting pipe. Second important duty of cutting pipe is being a fixed bed against form pulley during forming the wire. It must be paid attention to use cutting pipe in conformity with the diameter of the hole according to the wire diameter used.

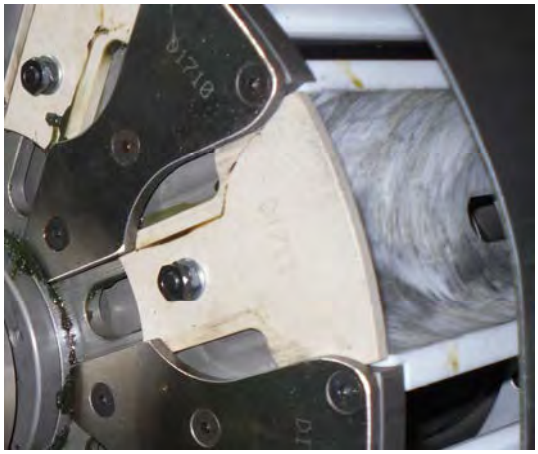


Spring body furthermore has various elements such as turret and temper bridge stabilizer, safety sensors.



TURRET

The spring coming out as spring body must be removed from spring output zone. Then it must be sent to temper station to harden by heat treatment for which turret was designed to enable these operations is made on the machine.



Turret consists of a drum having spring beds on which have semicircle form. One edge of each bed is closed with a cap, and the other edge is limited by a dynamic arm adjustable depending on the length of the spring.

In the output point of the spring, the edge cap is open and limiting arm is behind. When the spring starts to come out moves freely in this bed, when outcome is completed the spring unlatches and the magnet located on the right bottom turret enabling the spring remain in the bed is taken towards to moving arm. Hence, the spring is voided to be on the cap while the bed cap is closed.