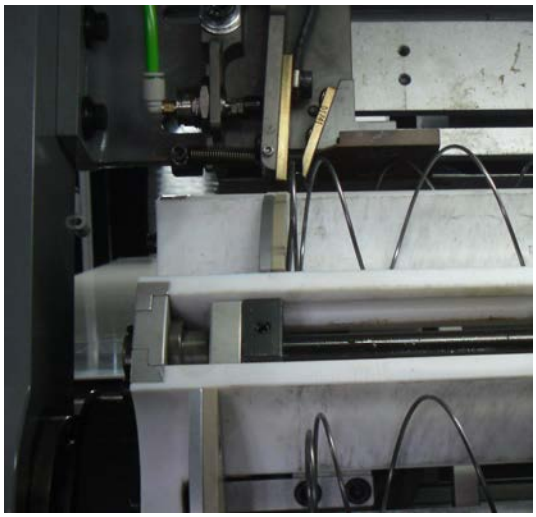
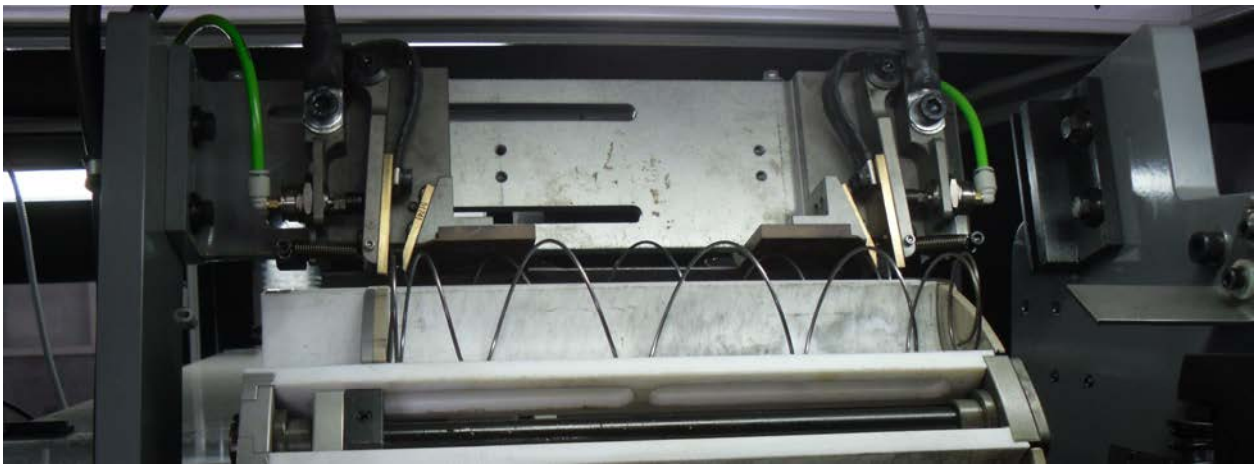


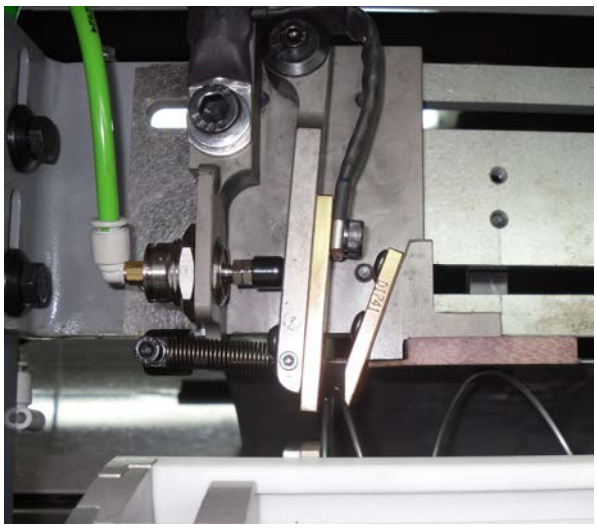
Turret turns forward one step and repeats the same processes, the spring is put to temper length by moving arm and bed cap is closed in the prior stages before temper position. The spring is ready to temper as fixed with head rings. While the machine is adjusted depending on the length of the spring, middle plate must be adjusted which carries moving arms on the turret. Middle plate fixing plates releases and then the plate is fixed to desired interval again.

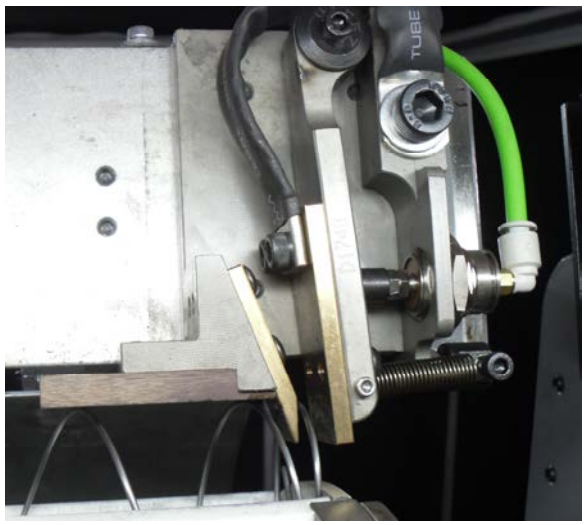
Temper group consists of two holders insulated from the body. There are one fixed and one moving contact on each holder. Spring heads are fixed to places and moving contacts are enabled to hold spring heads by a pneumatic pusher when they come near the fixed contacts.



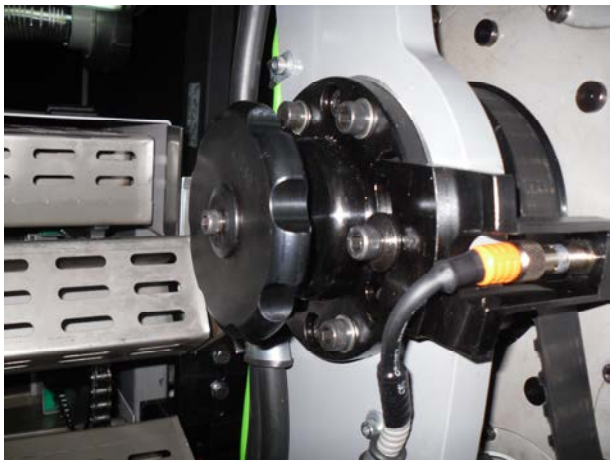
A temper current is fed between two edges of the spring insulated electrically from the body and the spring is heated up to 270°C. The spring reaching temper temperature gains spring property after hardening.

There are two settings to be adjusted prior to manufacturing depending on the spring size. Place of left holder group must be adjusted depending on the length of the spring. Since right holder alignment is on the fixed edge, it does not need to change its place.





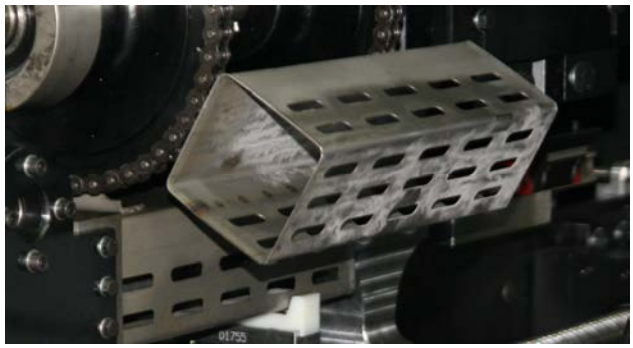
Second adjustment is height adjustment of temper bridge depending on the spring diameter. Slotted temper connection on the turret carrier is adjusted to desired height loosening the screws and then screws are tightened. Each holder group is electrically insulated from the body; therefore holder groups must be cleaned periodically.

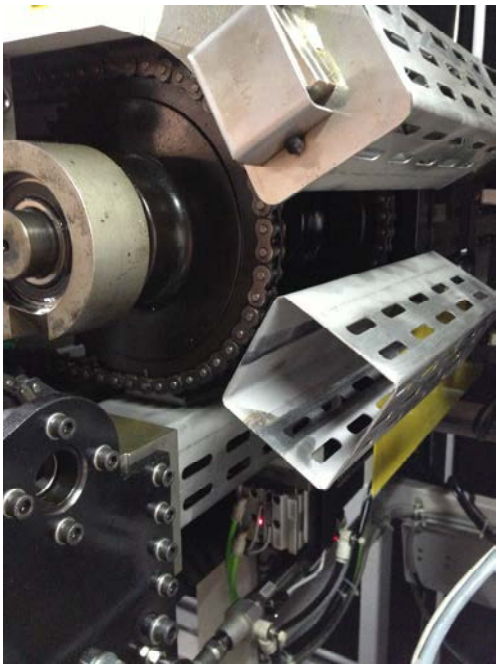


COOLING CONVEYOR

The spring overheated during tempering must be cooled down in order to not damage fabric while bagging in the next step.

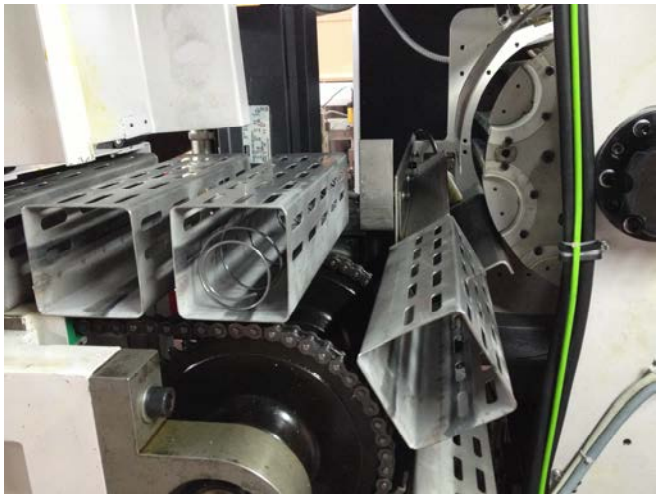
Cooling conveyor composed of metal cooling boxes aligned on the carrying chain is used for this process.





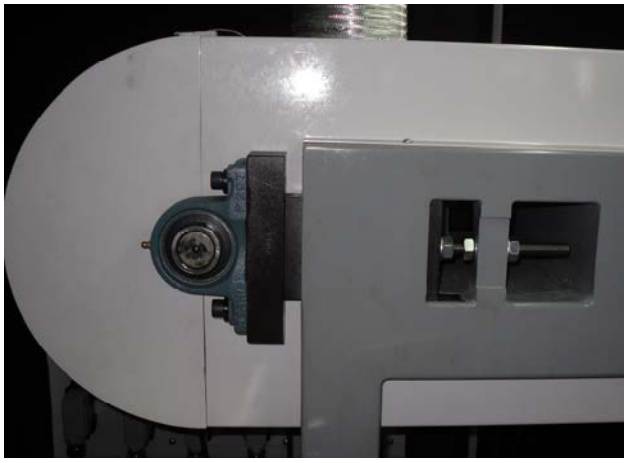
The spring of which temper process is completed drops on transfer channel from turret. Magnetic holder is used to avoid undesired movements of the spring on the channel. The magnets catching the spring during the spring drops down, release the spring when the piston would push the spring to the box.

In order to avoid the spring rebound which is pushed into the box by piston, a magnet is located behind the sheet closing the other opening of the box. In the event that spring comes out of the box for any reason even partially, the spring touches to sensor sheet in the first step of the box and cause a defective spring alarm on the conveyor, the door located on the conveyor input is used to interfere such springs. It must be paid attention that there must not be more than one spring in transfer channel in stops and after reset.



Conveyor movement is ensured by a reducer driven by a servo motor. Position is checked by absolute encoder in the axis to avoid position failure.

There are 36 boxes on the conveyor most of which are located inside the closed cooling channels. Hot air inside these parts is exhausted outside the machine by air discharge vent. Cooling boxes used in the conveyor depends on the size of the spring manufactured by the machine. Sizes are provided in the table.



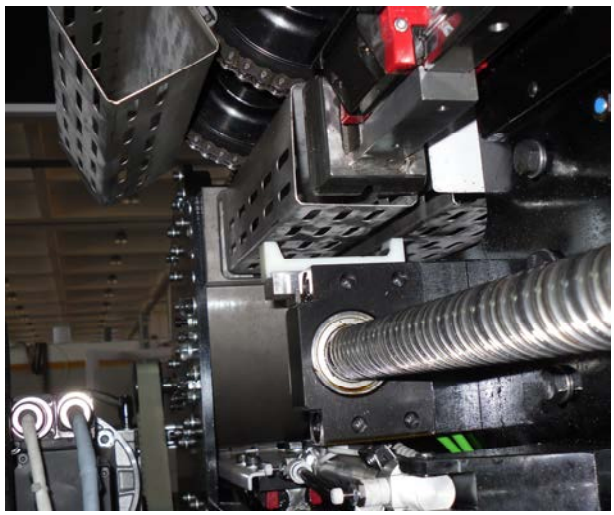
Through point of the conveyor is used to change the boxes. They are replaced on conveyor gear opening round channel door, the box is taken out removing lock clamp and the other box is installed.

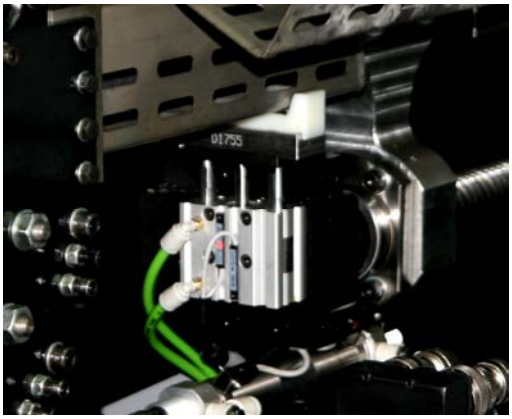
Control switch on the left side of the conveyor is turned on and forward backward buttons are enabled to use for hand controlled movement of the conveyor.

These buttons enables the conveyor move quick and easy during box replacement. Following box replacement, tension of conveyor chain must be inspected.

CRASHING AND TRANSFER

Next step is to put cooled springs into fabric pocket after compressing. Compression starts when the spring boxes come in front of the transfer block coming bout of cooling channel. Crashing anvil moved by a ball screw compresses the spring towards the through point of transfer block passing through spring box.

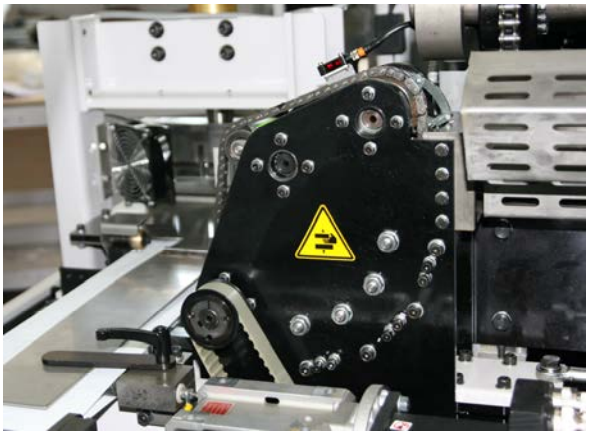




In order to avoid crashing anvil to damage the box during this movement, the box is fixed with a fixing piston located in the bottom and releases after crashing anvil is taken back.

Crashing block and crashing anvil to be used are selected depending on the spring manufactured as it was for cooling box. After these parts replacements, crashing axis limits and crashing distance adjustments must be checked. Crashing anvil must be adjusted as to protrude at least 5mm and the distance between crashing block and crashing must be 8 mm.

The spring compressed into crashing block must be conveyed to the slide at first to put into the fabric pocket. Transfer chain is used as well as transfer channel for this purpose. Transfer chain is a chain pushing the spring inside the transfer channel with its trap.

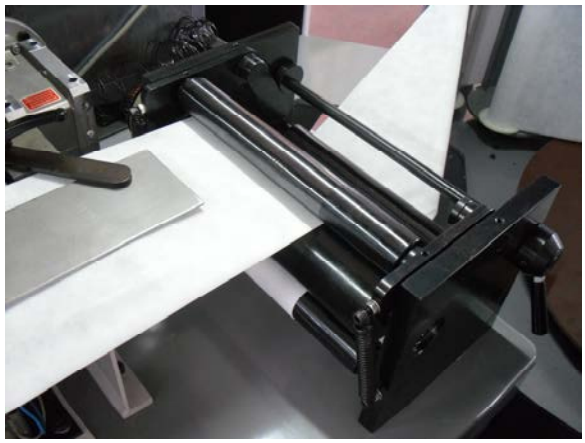


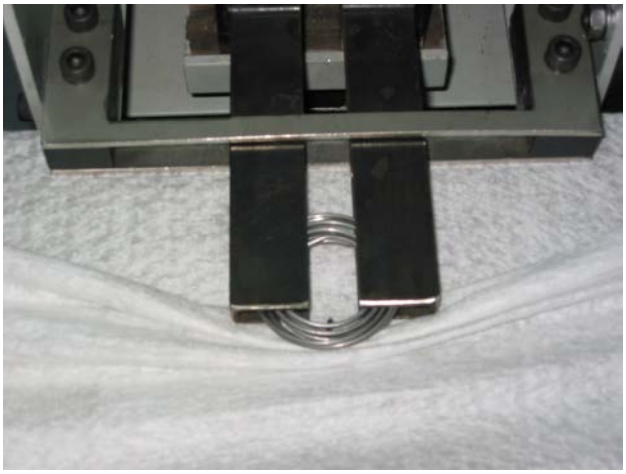
This chain synchronized with crashing group inserts the spring inside the channel pushing in the moment of compression. The spring pushed along the channel is transferred to the slide located at the end of the channel. Docking parts enabling the spring move in the middle of the channel must be adjusted according to the size of the spring. Slide is the system putting the spring into fabric pocket conveying it between fabric pocket and transfer channel.

Back movement of the spring brought into the fabric by slide by a needle holing the fabric vertical. The spring held by the needle remains inside the fabric pocket coming out of the slide. The needle electrically insulated from machine body is used to detect whether the slide brought a spring and therefore it is ensured that all the pockets are full. It must be paid attention to the needle not to touch cover sheet on the fabric during its operation.

FABRIC TABLE

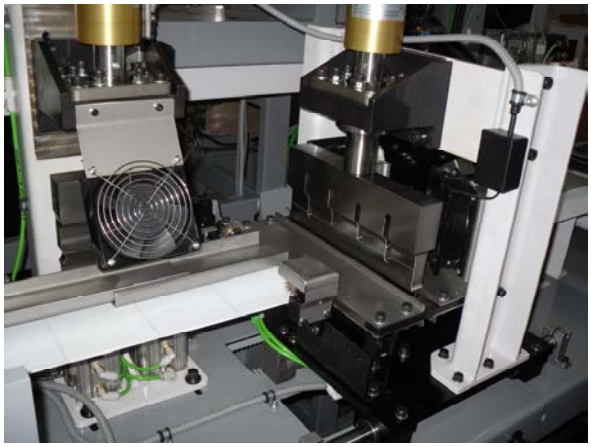
The fabric coming out of the fabric reel as folded in two slides into fabric table passing through fabric feeder group cylinders.





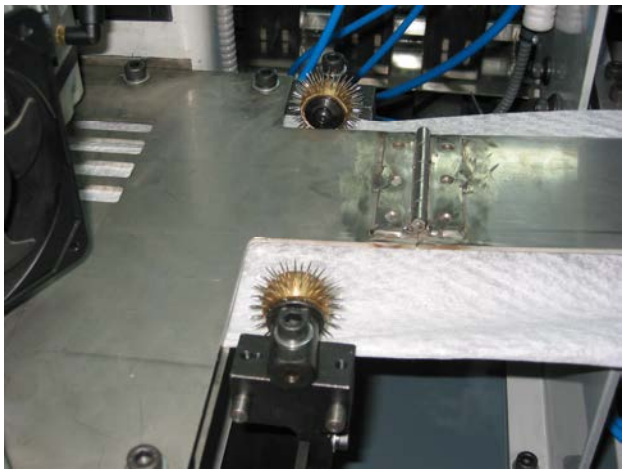
It comes out passing respectively main welding, side welding, fabric drawer and release group. The spring taken from the slide by needle is put between spring and fabric.

The spring compressed and held between fabric and its cover moves with the steps of adjusted fabric pocket length. Fabric pocket length is entered to control board as other spring specifications. In order to fix the place of the spring moving step by step inside the fabric, the fabric is welded in between the parts of the pocket in main welding station.



Ultrasonic welding is preferred as a welding system according to the speed of the machine. The system attaching the welding material between welding openings vibrating and melting with 20 KHz oscillations is composed of probe, booster, horn and anvil. Welding time is approximately 200 ms. Probe, booster and horn ate fixed to the upper part of the machine and anvil is used as moving part of the lower section and the movement is ensured by pneumatic power.

In accordance with the welding system structure, there must be nothing except fabric when horn and anvil compresses the fabric. In case a spring interferes, horn and anvil would be permanently damaged. In order to avoid this undesired event, the welding area is checked by safety piston in one step before the welding process.

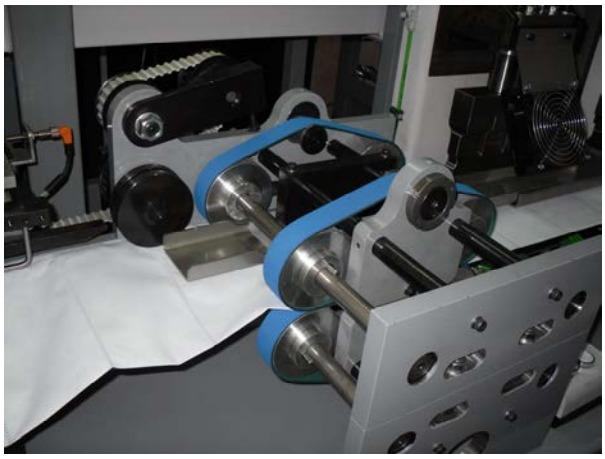


If there is a spring in the zone, the machine stops automatically. Place of the safety piston must be adjusted depending on the pocket length prior to start the production. Another important subject in welding process is that the fabric must enter welding zone in smooth without folding. Edge inspection is carried out on the fabric using rotating pulleys with needle to avoid wrinkle. These pulleys are screwed in angles to keep the fabric stretched.

Another equipment on the main welding group is cutting gap. If the bands coming out of the machine would be aligned by hand, the cutting gaps of said bands must be adjusted during main welding. When this property will be used, control panel must be activated by control panel and the number of each band must be specified. When cutting gap is desired in a work, two welding processes with 20 mm intervals must proceed consecutively for the intervals to cut.

Open edges of fabric pockets coming to edge welding unit after main welding is closed here with the same welding system. Position adjustment doesn't change since this welding is proceeded on the fixed edge of the fabric.

Pockets closed in welding stations goes to fabric drawing group. Fabric drawing group works in synchronization with the fabric feeder group. There are slight driving differences between these two groups to keep fabric stretched. The springs coming inside fabric drawing group go on to move between bottom and top slides since springs are still compressed.



The band held by drawing bands are released from bottom and top slides of the fabric drawing group. The band is held only by tuft after this point. Closed springs inside the band held in between conveyor chain and press plate under release unit are ensured to release in the pocket direction of the spring by release rod. Height of the release bottom must be adjusted according to the diameter of the spring.

ASSEMBLY:

In order to start operating the machine, first right location should be chosen. The location should have a strong and flat floor surface that is appropriate in the measurement in the layout plan. After the assembly, one of the main points to be taken care of is, in order to open the doors of the cabins without any problem, to place wire basket in the winder, there should be no obstacles in the product output section.

It is recommended to store the transportation boxes by disassembling them beginning with the top cover to be re-used when necessary.

Main parts of the machine in taken off the bases by means of forklift y disassembling the special clamps connected to the base of the box. Protective nylons are taken of and the protective grease is thoroughly cleaned.In the assembly area, the bodies of textile table, conveyor and spring group is installed in the order appropriate to the layout plan. The levels of these three bodies to each other are adjusted by means of adjustable stands and connection points are fixed to each other.

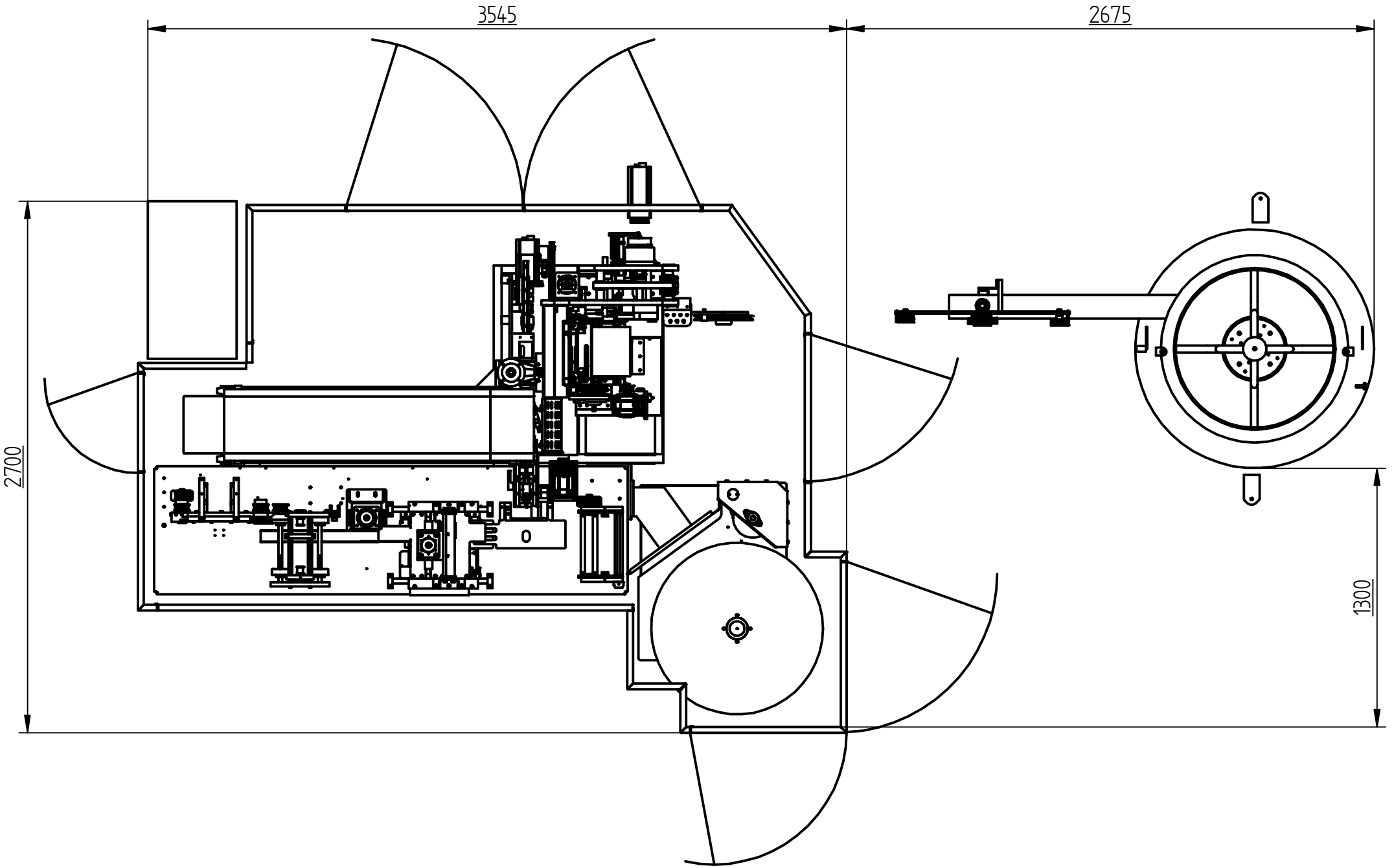
Internal assembly is completed by connecting belts providing the movement relay between them. Due to its modular structure, outside the bodies, first cabin front part is brought near then cabin walls and top part is placed in this sequence and cabin is formed.
There are two important units besides the main body. Since these units have compact structures, they are placed in required distances to the machine and mechanic layout is concluded.
Electrical connections should absolutely be done by authorized personnel with utmost attention. Cables and plugs between the machine electrical panel and other parts should be installed in a correct way and the labels should be controlled.

Power should be supplied to the machine's appropriate wire over the network plug in the electric panel with power outlet next to the panel and the correct sequence of the phases should be checked. Since there is a phase checking relay in the machine, it should not be forgotten that the machine will not operate in a phase problem. The connections between machine bodies and the main ground should absolutely be checked.

The air input of the machine should be provided from the input valve under the spring body, appropriate compressor should be chosen to allow dry and stable air into the machine. Bu choosing a hose with appropriate cross-section decrease in capacity should be avoided.

To operate the machine, by placing textile roll in appropriate measurement to the textile winder, and the wire basket in the wire winder the input of the materials into the machine is provided. Since the adjustments of the factory before the delivery is done depending on he customer's requests, other than the small adjustments arising from wire and textile differences, the machine will be ready for operation.

**Since the machine has a complex structure, its operation and personnel training is realized by our factory's trained personnel.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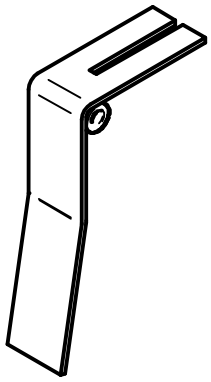

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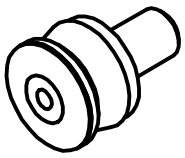

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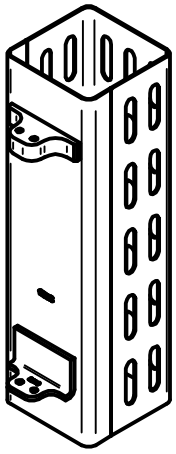

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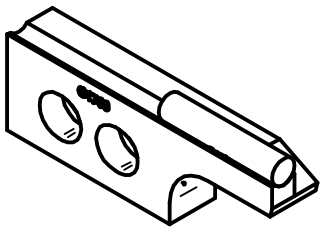

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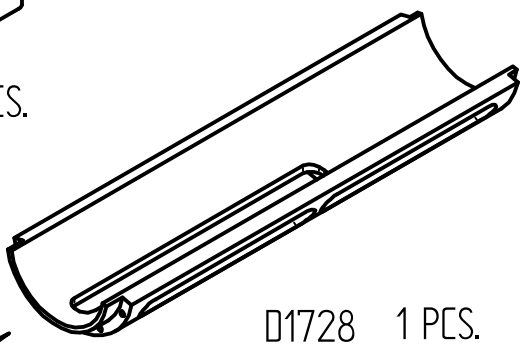

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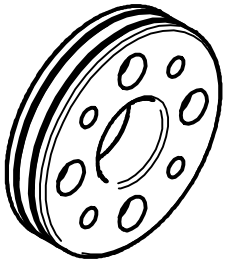

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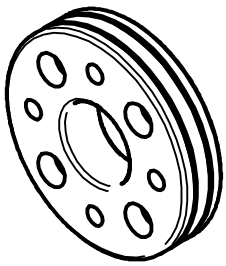

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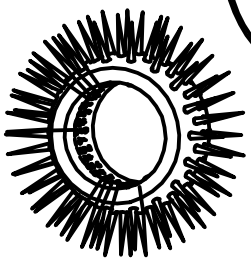

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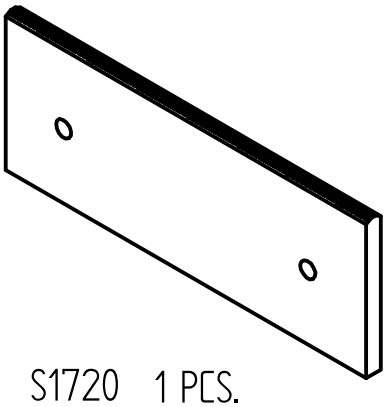

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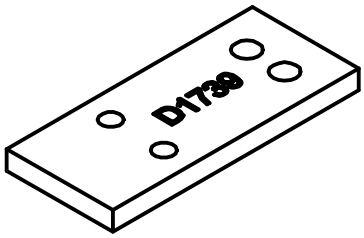

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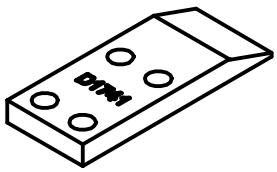

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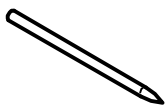

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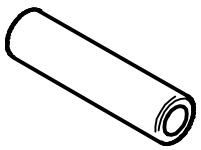

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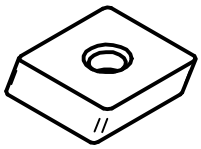

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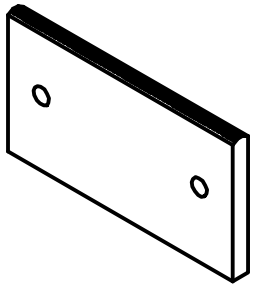

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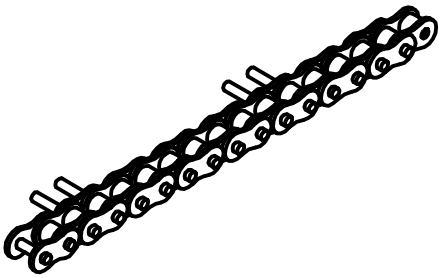
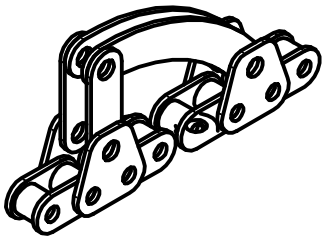
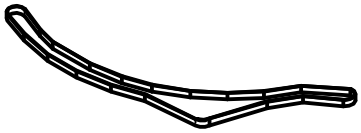


CONVEYOR CHAIN 1 Mt.



TRANSFER CHAIN 1 SET



TIMEING BELTS 1 SET