

CM patent of a fine adjustment system of the needle guard on vertical rotary hooks

It is well known that lockstitching is created when the hook point grazes the needle, and catches the loop formed by the needle thread.

FUNCTION OF THE NEEDLE GUARD

- During the sewing operation, the needle guard mounted on the vertical hook has the function to prevent that the needle collides with the hook point because of a bending due to any kind of exerted force, as for example by the material, causing the breakage of the needle or damaging the point of the hook.

This needle guard made of an arch shaped metal sheet (plan view), rotates jointly with the hook body and needs to be adjusted in its radial position in respect to the hook point according to type and size of the needle used.

- Needle guards used so far can be grouped into three families depending on their constructive typology:



1. "Flanged needle guards": produced from an L-shaped metal sheet that is placed with its flat face between the hook and its axial support on the sewing machine. The adjustment occurs by manual deformation and can be only rough.
2. "Needle guards mounted on a flange" fixed on the back of the hook and usually adjustable by an eccentric pin and a fastening screw. The adjustment occurs through a complex and expensive mechanical system
3. "Peripheral needle guards" obtained from an arched bent metal sheet fastened with screws on the side of the hook.

CURRENT PERIPHERAL NEEDLE GUARD ADJUSTMENT

Three different adjustment systems are known according to the hook types:

- a) The needle guard is curved by hand during the assembling operation and fastened with two screws to the hook. The adjustment can therefore be only rough and inaccurate.
- b) The needle guard is already naturally bent outwards in respect to the necessary adjustment. The screw located between the fastening screw and the needle guard point (which is in correspondence with the hook point) provides the adjustment: tightening this second screw, the needle guard is forced inwards. This method has the disadvantage to need an additional system for the positioning of the needle guard (with space problems that not always make it possible) and to present as opposition to the deviating force of the needle the merely elastic effect of the needle guard sheet, not warranting a 100% functionality.
- c) The needle guard is already naturally bent inwards in respect to the necessary adjustment. A third screw on the side of the hook body, in correspondence of the point of the needle guard and below the hook point, provides the adjustment outwards. In fact, unscrewing this third screw, it presses against the point of the needle guard, forcing its deformation toward the outside. This system has the disadvantage to not be always applicable because of lack of space on the side of the hook to place the third screw close to the hook point.

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CM PATENT FOR PERIPHERAL NEEDLE GUARDS

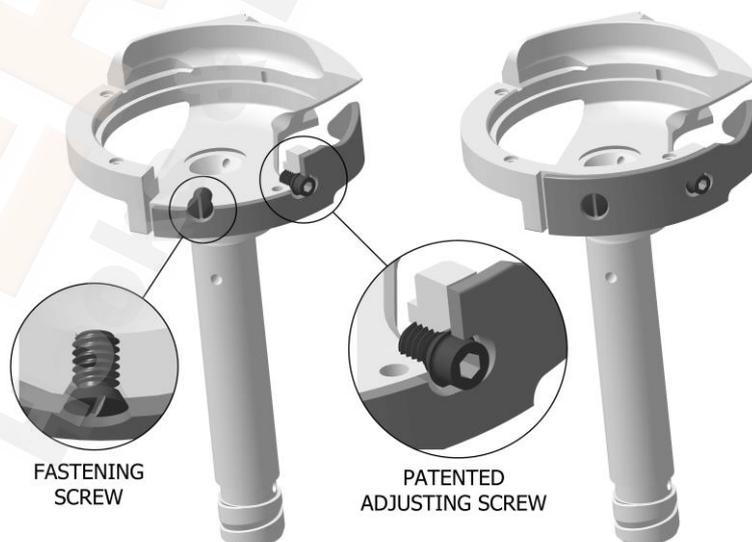
The innovative idea of the patent produces a fine adjustment of the peripheral needle guard fastened with only two screws to the hook, without the necessity of the third screw for the mere adjustment function.

This adjustment method is applicable on a large scale and it is particularly interesting for the vertical hooks that, because of lack of space problems, do not allow the application of a third screw close to the hook point. Furthermore, the patented method turns out to be simpler and more economic, needing one less screw than the known system.

Among the several patented variations the following method appears to be particularly appreciated by the users:

The needle guard (mounted with two screws and bent naturally inwards) is forced outwards by unscrewing the adjusting screw placed between the fastening screw and the point of the needle guard in correspondence with the hook point, thus obtaining the necessary adjustment.

As a matter of fact two screws are used: one countersunk screw for the positioning and fastening, while the second screw with the function of positioning and adjustment operates by thrust and has a special shape with a cylindrical pin projecting from the screw head. This pin enters a hole on the needle guard through which it is also possible to operate in order to tighten or unscrew the screw and adjust this way the functionality.



The innovation produced by this patent allows the fitters and technical assemblers to adjust with precision the needle guard through a simple cheap and reliable operation.

For thick needles the adjusting screw has to be screwed in to adjust the needle guard towards the inside of the hook point.

For fine needles the adjusting screw has to be unscrewed in order to adjust the needle guard towards the outside of the hook point.

Every hook type with peripheral needle guard can be ordered equipped with this patented needle guard by adding "R" to the hook's reference number;

Example:

Mod. standard
130.15.000

Mod. patented
130.15.000R