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**ELABORATION OF AN EFFECTIVE CONSTRUCTIVE SCHEME OF
THE NEEDLE THREAD TENSION REGULATOR WITH ELASTIC
ELEMENTS OF DIFFERENT RIGIDITY**

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Annotation. The article presents the results of the analysis of existing needle thread tension regulators in sewing machines, the advantages and their disadvantages are presented. On the basis of the analysis the effective constructive scheme of the needle thread tension regulator is developed. The constructive elements and principles of operation of the regulator of needle thread of the sewing machine are described in detail.

Keywords. Sewing machine, needle regulator, thread tension, plate, elastic element, rubber, rod, washer, adjustable screw, rigidity, uniformity, efficiency.

Development of a constructive scheme of the needle thread tension regulator. The main task of the research is to increase the mobility of the convex plates of the interval and smoothness of regulation of the thread tension elimination of thread breakage at high-speed modes of sewing materials.

The set task is solved by improving the design of the tension regulator by increasing the mobility of the plates both along the axis of the rod and angular oscillations along their vertical axes and by using conical rubber sleeves with opposite direction of cones.

The essence of the design lies in the fact that the needle thread tension regulator sewing machine consists of a rod, put on it two convex plates, on both sides of which are installed two conical rubber bushings with the opposite direction of the cones. In this case, the ends of the conical rubber sleeves are made with a curvilinear shape, which enter the spherical in the shape of the made recesses of the corresponding

plates. In addition, the inner holes of the plates mounted on the rod are also spherical in shape. Spherical shape of the ends with a smaller diameter of conical rubber sleeves and spherical shape of the inner holes of convex plates allow the movement of the plates not only along the axis of the rod, and angular movement relative to their vertical axis. This leads to increased mobility of the convex plates, which adjust to the change of tension, also to the direction of influence of thread tension, eliminate thread breakage.

The design is explained by a drawing, wherein Fig. 1 - shows the design of the regulator with a section.

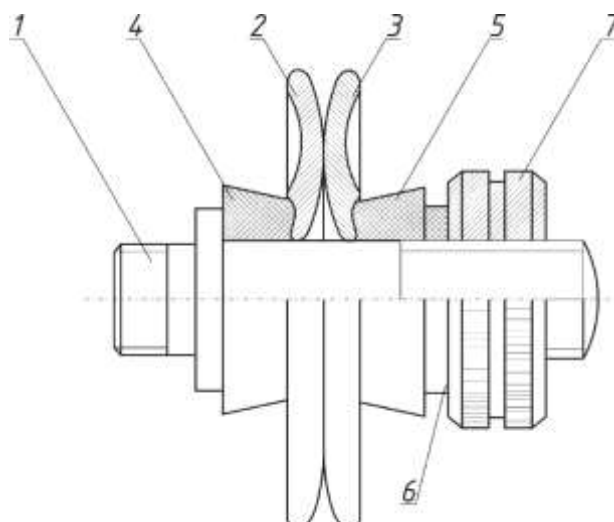


Fig.1. Sewing machine needle tension adjuster

The needle thread tension regulator consists of a rod 1, which is rigidly fixed to the machine head. Two convex plates 2 and 3 are put on the rod 1, between which the needle thread passes (not shown in Fig.). From the two old plates 2 and 3 are mounted two conical rubber bushings 4 and 5. Tapered rubber bushings 4 and 5, rest against the plates 2 and 3 by means of a washer 6 by means of an adjusting nut 7.

The tapered rubber bushings 4 and 5 are mounted on the rod 1 with opposite direction of taperedness. The small-diameter ends of the tapered rubber bushings 4, 5 are spherically shaped, which enter the identically shaped recesses of the convex plates 2 and 3. In addition, the inner holes of the plates 2 and 3 mounted on the rod 1 are also spherically shaped.

The design works as follows. The needle thread passes between the plates 2 and 3. When it is necessary to adjust the thread tension, the adjusting nut 7 is turned, which presses the plates 2 and 3 against each other by deforming the conical rubber

sleeve 5. At the same time, the tapered rubber sleeve 4 is also deformed. Plates 2 and 3 not only press the thread, increasing its tension, but also oscillating in the longitudinal direction on the rod 1, as well as rotating relative to the vertical axis, automatically set the necessary values of the needle thread tension.

This practically eliminates sudden changes in thread tension, thereby reducing thread breakage.

Conclusions. An effective constructive scheme of the needle thread tension regulator with elastic elements with different stiffnesses is recommended. The design features and operating principle of the shuttle thread tension regulator of a sewing machine are given.

References

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