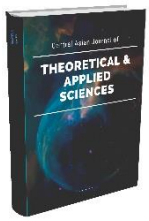

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Improvement of Designs and Methods for Calculating the Parameters of Bobbins for a Sewing Machine

Vafoyeva Zamira Sevindikovna, Bexbudov Shavkat Husenovich
Bukhara engineering technological institute, Matyakubova Jumagul Bakhtiyarovna, Urgench State University

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Abstract: *This article discusses the design of the spinning shuttle in the garment industry. A popular design is the shuttle spool, which consists of two circular discs tightly connected to each other.*

Key words: *disadvantage, bobbin, solved, plastic, design, machine, shuttle, surface, rubber, objective, latera.*

The invention relates to the sewing industry, in particular to sewing machines, namely the construction of a bobbin for a shuttle thread. Known bobbin design, consisting of two round discs rigidly connected to each other by a sleeve [1, 2].

The disadvantage of the known design is the impossibility of ensuring a uniform tension of the shuttle thread when it is unwound in the process of sewing materials. When unwinding the thread from the bobbin, depending on the location of the current turn of the thread with a change in the radius of its location, a variable unwinding force is required. At the very beginning of the unwinding of the thread, the turn on the bobbin is located at a large radius of the bobbin and therefore a small tractive force is required to unwind it, and when the thread is used up at the very end, practically the radius of the last turns in the bobbin is at a radius equal to the outer radius of the bobbin sleeve. However, a large pulling force is required to unwind these last turns of thread from the bobbin.

To ensure the uniformity of the tension of the shuttle thread when unwinding them, that is, when sewing materials, the design of the bobbin winder has been improved [3,4].

Known bobbin winders for a sewing machine containing a base, a frame, a drive wheel, a bobbin, a latch mechanism, a thread tension mechanism and a thread cutting mechanism are not reliable in operation and have low productivity.

A bobbin winder for a sewing machine containing a base, a frame, a drive wheel, a bobbin, a latch mechanism, a thread tension mechanism and a cutting mechanism, while in order to increase productivity, the thread tension mechanism is made in the form of a square, one of the shelves of which has a thread guide slot and a hole, and the thread cutting mechanism is also made in the form of a slider with a striker coming out and a hole at the end of the bobbin winding [3].

The disadvantage of these bobbins for the sewing machine is the complexity of the design and the impossibility of ensuring uniform tension of the shuttle thread when it is unwound during sewing of materials due to the lack of a means of adjusting the thread tension in the bobbin with a gradual decrease in the radius of the turns.

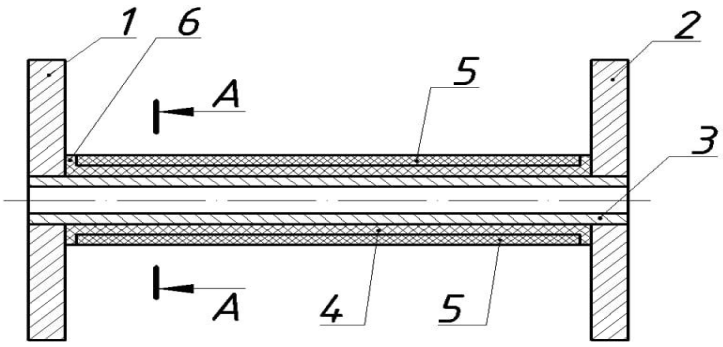
In the known design of the sewing machine 852 cl PMZ [4] (prototype), the bobbin consists of two lateral circular disks rigidly connected to each other by means of a metal sleeve. The disadvantage of this design is also the impossibility of ensuring the uniformity of the tension of the shuttle thread, both during winding and unwinding.

The objective of the invention is to ensure uniform tension of the shuttle thread during winding and unwinding from the bobbin, allowing a significant reduction in thread breakage and an increase in machine productivity.

The task is solved by improving the design of the bobbin, equipped with an elastic element.

The essence of the design lies in the fact that the bobbin for the sewing machine contains two lateral circular disks rigidly connected to each other by means of a metal sleeve, to which a rubber elastic sleeve is put on. On the surface of the rubber sleeve, plastic sticks are installed with a certain pitch. In this case, the stick half of the thickness enters the groove of the rubber sleeve, and the rest (the second half of the thickness) protrudes outward from the rubber sleeve. This allows in the process of winding the bobbin with the shuttle thread, uniform tension in the turns over the entire thickness of the wound thread. This is also ensured during the unwinding of the thread.

The design is illustrated by a drawing, where figure 1 is a general view of the bobbin in section; in fig. 2 - view A-A in Fig. 1.



The bobbin design for the sewing machine consists of two lateral circular discs 1 and 2, rigidly connected to each other by means of a metal sleeve 3. A rubber sleeve 4 is put on the sleeve 3, which has grooves along the outer surface with a certain depth and pitch. On the grooves of the rubber sleeve 4, plastic sticks 5 are installed, while part of the sticks 5 protrude from the surface. At the edges, the rubber bushing 4 has protruding parts 6 equal in height to the sticks 5.

The design works as follows. The shuttle thread is wound on the rubber sleeve 4 with plastic sticks 5. At the same time, due to the tension of the thread, the rubber sleeve 4 is deformed. At the beginning of the thread winding, due to the small radius of the thread turns, the force and the amount of deformation will not be large. With an increase in the number of screws, the thickness of the wound thread, the deformation of the rubber sleeve increases. At the end of the winding of the thread, the rubber sleeve 4 will be in a deformed state. At the same time, with the beginning of the operating mode, the shuttle thread is unwound gradually, cyclically. At the same time, due to the exposing force of the deformed rubber

sleeve 4 by means of plastic sticks 5, it allows unwinding of the thread and leads to equalization of its tension. Plastic sticks 5 do not allow the introduction of threads into the rubber sleeve 4. By choosing the appropriate brand of rubber, the parameters of the sticks 5 and the rubber sleeve 4, you can provide the required modes of winding and unwinding the shuttle thread from the bobbin to the sewing machine.

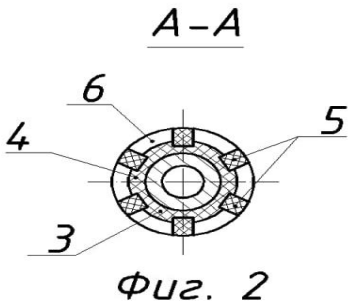
The design of the bobbin for the sewing machine provides uniform tension of the shuttle thread during winding and unwinding, leading to a decrease in thread breakage, to an increase in the speed of the machine.

The invention relates to the sewing industry, in particular to sewing machines, namely the construction of a bobbin for a shuttle thread.

The objective of the invention is to ensure uniform tension of the shuttle thread during winding and unwinding from the bobbin, allowing a significant reduction in thread breakage and an increase in the productivity of the machine. The task is solved by improving the design of the bobbin, equipped with an elastic element.

The essence of the design lies in the fact that the bobbin for the sewing machine contains two lateral circular disks rigidly connected to each other by means of a metal sleeve, to which a rubber elastic sleeve is put on. On the surface of the rubber sleeve, plastic sticks are installed with a certain pitch. In this case, the stick half of the thickness enters the groove of the rubber sleeve, and the rest (the second half of the thickness) protrudes outward from the rubber sleeve. This allows in the process of winding the bobbin with the shuttle thread, uniform tension in the turns over the entire thickness of the wound thread. This is also ensured during the unwinding of the thread.

A bobbin for a sewing machine containing two round side discs rigidly connected to each other by means of a metal sleeve, characterized in that an elastic sleeve is put on the sleeve having grooves along the outer surface with a certain depth and pitch, on which plastic sticks are installed, protruding outward from the rubber surface bushings, and at the edges of the rubber bushing is made with a protruding part, even in height of the sticks.



Фиг. 2

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