



# International Journal for Innovative Engineering and Management Research

A Peer Reviewed Open Access International Journal

www.ijiemr.org

**COPY RIGHT**



**ELSEVIER**  
**SSRN**

**2021 IJIEMR.** Personal use of this material is permitted. Permission from IJIEMR must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copyrighted component of this work in other works. No Reprint should be done to this paper, all copy right is authenticated to Paper Authors

IJIEMR Transactions, online available on 19th April 2021.

Link: <https://ijiemr.org/downloads/Volume-10/Issue-4>

**DOI: 10.48047/IJIEMR/V10/I04/66**

Title: **IMPROVING THE YARN WINDER ON THE SEWING MACHINE**

Volume 10, Issue 04, Pages: 272-274

Paper Authors:

**Vafaeva Zamira Sevindikovna**



USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per **UGC Guidelines** We Are Providing A Electronic Bar Code

## IMPROVING THE YARN WINDER ON THE SEWING MACHINE

Vafaeva Zamira Sevindikovna

Bukhara Engineering and Technological Institute

**Abstract:** This article is based on scientific research of the yarn winding device on the sewing machine, analysis of the literature and the study of the principles of the sewing machine.

**Keywords:** thread winding, bobbin, bobbin case, bobbin winders, vertical hook, thread spools, ring, frame, flywheel, latch mechanism.

### Introduction

Each sewing machine has a bobbin, except for chain stitch sewing machines. Each machine has a special device for winding the bobbin. For sewing machines with a horizontal hook, the bobbin is inserted into the bobbin case. For machines with a vertical shuttle, the bobbin is inserted from above, directly into the shuttle course. Thread the bobbin under the hook spring plate or bobbin case anyway.

Such a "trifle" as winding a thread on a bobbin often creates a lot of inconvenience when sewing. Actually, any seamstress, even a beginner, knows how to wind a thread on a bobbin, especially since there is a visual instruction and this operation itself is so elementary that there is no need to explain in detail and in photographs how to wind a thread on a bobbin. But for some reason it is not always possible to quickly and "without problems" do it. Let's see why it is sometimes difficult to wind the thread on a bobbin and what needs to be done to eliminate minor damage to the winder.

Many theses have studied the technology of winding yarn with a spinning mechanism with a rotating tool for assembling spinning rings, only for the purpose of increasing the productivity of ring spinning machines and improving product quality, no scientific research of the sewing machine.

In the proposed automatic bobbin machine for winding thread on sewing spools, the thread is unwound from a common bobbin and passes through the inner hole of the spindle, which is rotated from the gear. From the spindle, the thread is directed to a stationary bobbin and is wound on the last from the

rotation of the spindle, and the bobbin. The spool is set on radially located pins located inside the ring, and is automatically fed for winding. The ring, placed on the eccentric - together with the pins, makes an intermittent rotational movement relative to the eccentric at a certain angle.

The invention relates to light industry, in particular to sewing machines.

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 tension mechanism and a thread cutting mechanism are not reliable in operation and have low productivity.

In order to increase productivity, the thread tension mechanism of the described bobbin winder is made in the form of a square, one of the legs of which has a thread guide holes and slots, and the other has a guide slot and a hole. The thread cutting mechanism is made in the form of a slider with a striker entering the hole at the end of the bobbin winding.

A frame is fixed to the equipment, resting on it with a spring-loaded brush. The frame carries a spindle with a drive wheel at one end and a bobbin bobbin at the other. A latch is also attached to the base, connected to the frame and interacting with the bobbin flanges.

The proposed automatic bobbin machine consists of a bobbin box, into which an arbitrary number of bobbins is placed, which, by their own weight, press the lower

- spool to the outer circumference of the ring.

The ring rotates intermittently about the eccentric axis, which is at the same time the ring. Several pins are located radially inside the

ring. The ends of the pins, directed to the axis of rotation of the ring, about the out-of-motion eccentric and are pressed against it. Springs located between the head of the pins and the inner circumference of the ring.

We must also keep our accounts in accordance with the following formulas. The volume occupied by the wound thread on a conical bobbin, taking into account the bulge at the ends of the bobbin

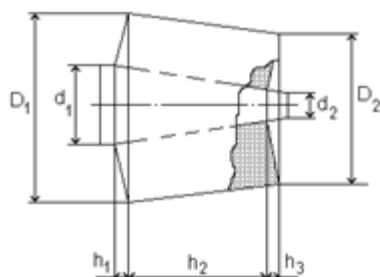
$$V = \frac{\pi}{12} [(D_1^2 + D_1 d_1 + d_1^2) h_1 + (D_1^2 + D_1 D_2 + D_2^2) h_2 - (D_1^2 + D_1 d_1 + d_1^2) h_3 - (h_1 + h_2) \cdot (d_1^2 + d_1 d_2 + d_2^2)]$$

where  $D_1$  and  $D_2$  - large and small diameters of the bobbin with wound thread, cm;  $d_1$  and  $d_2$  - large and small diameters of the bobbin cartridge, cm;  $h_1$  - the height of the bulge of the winding sphere at the base of the bobbin, cm;  $h_2$  - height of the bobbin cone winding, cm;  $h_3$  - the height of the concavity of the sphere at the top of the bobbin, cm.

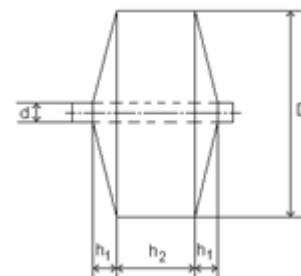
The volume occupied by the wound thread on a cylindrical bobbin, taking into account the bulge at the ends of the bobbin

$$V = \frac{\pi}{12} [2h_1(D^2 + Dd + d^2) + 3h_2 D^2 - 3d^2(2h_1 + h_2)]$$

where  $D$  is the diameter of the cylindrical bobbin winding, cm;  $d$  - diameter of the bobbin cartridge, cm;  $h_1$  - the height of the tapered winding at the end of the bobbin, cm;  $h_2$  - height of winding of the cylindrical part of the bobbin, cm



Conical bobbin



Cylindrical bobbin

Opposite ends of the pins pass through the body of the ring and protrude somewhat from its outer circumference. When the ring rotates, the pins move radially relative to the axis of rotation of the ring and slide along the outer surface of the eccentric. When moving along the eccentric, the pins protrude from the outer circumference of the ring either more or less, depending on which part of the eccentric surface they abut, being pressed by the springs.

The pins are designed to put bobbins on them and to prevent the latter from jumping off. The ends of the pins, protruding as rings, have slots designed to create a springy action between the ends of the pins and the bobbins.

The device for winding thread on a bobbin is practically the same for all sewing machines, including industrial sewing machines. There are, of course, rare examples with an independent adaptation of almost a quarter of the body of the machine, but they are not of interest to us. Such cars are already a museum piece. Modern machines do not have an external device for winding the thread; it is hidden in the body, except for the rod for holding the bobbin.

Look, there is a slot on the rod. You probably wondered what it is for. And it also has its own meaning. You've probably noticed that some bobbins fit tightly on this rod. This is due to the fact that all bobbin manufacturers cannot make a perfectly accurate inner hole in the bobbin. And in order for any bobbin to pass freely, this slot is needed in it.

Squeeze this rod lightly with pliers or, on the contrary, unclench it by inserting a screwdriver into the slot. And then the bobbin will be much easier to put on. Just be careful, otherwise you can break off one of the halves.

The spindle has a small "wheel" with a rubber rim, which is pressed against the flat part of the flywheel during bobbin winding. That's actually the whole device, it would seem that something simpler.

If we come to the conclusion of a bobbin winder to a sewing machine containing a base, a frame, a natural wheel, a bobbin, a latch mechanism, a thread tension mechanism and a cutting mechanism. Characterized by the fact that in order to improve performance, the thread tension mechanism is made in the form of a square, one of the shelves of which has thread guiding holes and slots and the other has a guide slot and a hole, and the thread cutting mechanism is made in the form of a slider with a striker entering the hole at the end bobbin winding.

## Literature:

1. Bobbin winder for the sewing machine. M.I. Zyuzin, A.V. Muratov - Moscow, 1971.
2. Formation of packages from chemical threads and optimization of winding parameters. Dissertation for the degree of Doctor of Technical Sciences. Sukharev Vladimir Alexandrovich - Chernigov 1983.
3. Progressive machinery and technology of spinning production Text .: interuniversity. Sat. scientific. tr. / ed. V.D. Frolova. - Ivanovo: IGTA, 1995.
4. Vilkov, P.V. Development of a stand for winding yarn into bobbins [Text] / P.V. Vilkov, A.N. Litvinsky // Young Scientists - Development of Textile and Light Industry (Search - 2000), April 24 - 26, 2000: abstracts. interuniversity, scientific and technical. Conf. - Ivanovo: IGTA, 2000. - S. 129-130.
5. Experimental study of the yarn winding mechanism with an electrified winding drum / V.F. Glazunov, 124 V.P. Shishkin, P.V. Vilkov, A.N. Litvinsky // Izv. universities. Technology of the textile industry.— 2001.— No. 3.— P. 91—95.
6. Vilkov, P.V. Improving the energy characteristics of the winding drum [Text] / P.V. Vilkov, V.F. Glazunov. // Young scientists - to the development of textile and light industry

(Search - 2004), April 20-22, 2004: abstracts. interuniversity. scientific and technical conf. - Ivanovo: IGTA, 2004. - S. 92-93.

7. Glazunov, V.F. Investigation of the tension of the thread in the process of rewinding it with an electrified winding drum [Text] /