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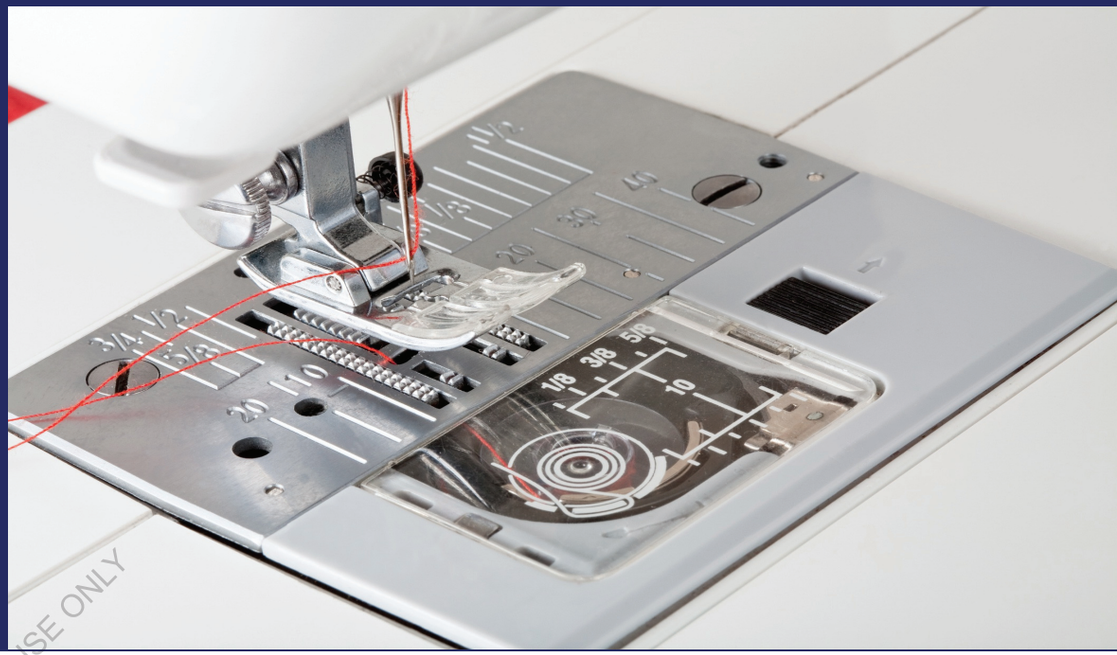

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FAZLIDDIN KURBANOV

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KURBANOV FAZLIDDIN AMINOVICH

DEVELOPMENT OF THE CONSTRUCTION OF THE SHUTTLE ON SEWING MACHIN

MONOGRAFIYA

Bukhara -2021

The monograph provides an increase in the productivity of the machine by installing an additional knife device for cutting threads on a sewing machine, develop and substantiate the parameters of an improved design for a threading device, determine the operating mode of the device, consider the issues of operating costs and design of a sewing machine.

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REPUBLIC OF UZBEKISTAN
MINISTRY OF HIGER AND SECONDARY SPECIAL EDUCATION
BUKHARA INSTITUTE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT «PRIMARY PROCESSING OF NATURAL FIBERS»

KURBANOV FAZLIDDIN AMINOVICH

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THE SUMMARY

In the monograph, calculations were made to increase the productivity of the PM3 1022 cl. sewing machine by installing an additional knife thread cutting device, developing and justifying improved design parameters of the thread filling device, and the operating mode of the device. The designs of sewing machines were thoroughly analyzed and designs of existing sewing machines were compared. The time for replacing the bobbin from the shuttle t and the graph of changes in labor productivity Q relative to the bobbin volume Vn are determined. A diagram of consumed and transmitted streams is built.

Theoretical and experimental studies have shown that the efficiency of the sewing machine is improved through the use of a new shuttle device.

АННОТАЦИЯ

В монографии вычислены для повышения производительности швейной машины ПМ3 1022 кл. за счет установки дополнительного ножевого устройства нарезки ниток, для разработки и обоснования улучшенных конструктивных параметров устройства для набивки пряжи, определено режима работы устройства, сокращающего эксплуатационные расходы. Были тщательно проанализированы конструкции швейных машин и сопоставлены конструкции существующих швейных машин. Время замены шпульки от челнока t и график изменения производительности труда Q относительно объема шпульки Vn. Была построена диаграмма потребляемых и передаваемых нитей.

Теоретические и экспериментальные исследования показали, что эффективность швейной машины повышается за счет использования нового челночного устройства.

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INTRODUCTION

As noted by President Sh.M.Mirziyoev, "Our main goal is to move forward despite the existing difficulties, to continue the ongoing reforms, structural changes in our economy, to open the way for private ownership, small business and entrepreneurship" [1].

The implementation of radical changes in the economy of the country, the gradual transition of the republic's economy from raw materials to the production of competitive products, the expansion of the country's export potential have set new tasks for each sector of production. In particular, the development of the garment industry, the provision of our people with high quality, beautiful clothing is one of the important tasks facing the light industry. Of course, in order to fulfill these tasks, it will be necessary to increase the production of garments, improve their quality, create new high-efficiency enterprises. At present, the sewing enterprises of our country are replenished with equipment based on the latest achievements of science and technology. Complex mechanization and automation of technological processes continues by equipping machines and equipment with various devices.

A complex of machines, mechanisms and transport equipment is being developed to mechanize the work at the garment factories. New machines are being introduced to detect fabric defects and accurately measure height and width. The design of garments was developed on a mathematical basis, and electronic computers became available. Programmable electronic control systems are used in cutting garments with laser beams, ultrasound, high-frequency electric spark.

The tasks of automating the process of making the finished product are performed automatically, with less time, on the sewing machines used to sew the cut parts together.

Sewing machines are widely used, which allow you to perform several technological processes at once.

Currently, the following work is being carried out on the complex mechanization and automation of sewing departments:

- Introduction of semi-fully and fully automated special mechanisms for auxiliary and manual work in the process of sewing garments;
- Development of a set of special devices and machines for sewing the main details of clothes;
- automation and control of heat and moisture treatment of products;
- use of special machines and small mechanized complexes that perform several tasks simultaneously.

Of course, along with the development of the garment industry, the industry will need to provide highly qualified, mature professionals who meet modern requirements.

The main task of the development of light industry is to ensure the competitiveness of products manufactured using local raw materials in the world market. In a market economy, this task is related to the level of technological equipment, as well as the introduction of science-based parametric machines and mechanisms. On sewing machines, when the shuttle thread is finished, the machine is stopped from operation in order to stop the machine from working and fill the shuttle tube with yarn, and when the yarn is filled, it is re-installed. This, in turn, leads to a slight decrease in productivity due to the extra time spent on sewing the item.

At present, these indicators do not meet the technical requirements, and therefore ways to overcome this shortcoming are being sought [2].

In order to overcome the above shortcomings, it promotes the issue of saving time by filling the thread by continuing to sew it in place without removing the shuttle tube.

The extra time spent sewing in the preparation of the item leads to a slight decrease in productivity. At present, these indicators do not meet the technical requirements.

When the shuttle thread is finished, to replace it with another filled tube, first stop the machine, remove the shuttle tube, the machine is switched to idle mode, the tube is mounted on a special device and the thread is filled from the spool to the tube. The sewing process is then continued by setting the thread-filled tube in place. This leads to a lot of time spent sewing the item and in turn a decrease in work productivity. Therefore, it is important to improve the sewing machine and calculate the parameters by filling the tube with yarn at the same time, that is, during the sewing process.

The purpose of the research work. Development and justification of the parameters of the improved design of the yarn filling device, together with the definition of the operating mode of the device, reducing operating costs, as well as the design of the yarn filling device additionally mounted on the sewing machine.

The task of scientific research work. Analysis of sewing machine designs, as well as comparison of existing sewing machine designs;

- to ensure that the design and installation of the tube filling device does not interfere with the worker and the work area;

- check the laws of motion of the device for filling the tube with yarn, which is installed on the sewing machine at different speeds of operation;

- provide automatic cessation of the movement of the tube after the thread is filled in the device for filling the thread;

- to determine the amount of savings of the shuttle thread in the improved device for filling the tube with yarn by means of experimental tests;

-Achieve an increase in machine productivity by saving time spent on filling the thread.

Subject and source of research. 1022 class PMZ universal sewing machine.

Research methods. Theoretical research was carried out through the application of general methods of applied mechanics, higher mathematics, the theory of general mechanisms of technological machines, the theory of vibration of complex systems. Determining the measures of breaking the thread when the tube is filled with yarn was carried out on the basis of a specially designed device, using the method of photocell measurement. Work was done to select the installation location of the tube and how convenient transmissions could be used to rotate the tube.

The main cases to be protected:

-determine the time spent on filling the tube with yarn on a sewing machine on the basis of experiments;

- The results of experimental research of the proposed yarn filling device;

-economic justification of the parameters of the device for filling the yarn into the improved tube

- check the dynamics, conditions of equilibrium, permanence and stability of the shear forces in the working areas of the device.

Scientific novelty. The following new scientific results were obtained on the basis of theoretical and experimental research:

- in the development and installation of the device for filling the tube with yarn, conditions are provided that do not interfere with the worker and the working area;

- the laws of motion of the device for filling the tube with thread, which is installed on the sewing machine, were checked at different operating speeds;

- automatic stopping of the movement of the tube after filling the tube in the device of thread filling;

- The amount of saving of the shuttle thread and electricity in the improved device for filling the tube with yarn by means of experimental tests was determined;

- In order to save time spent on filling the thread, the machine was able to increase productivity.

Scientific and practical application of the results of research work. Based on the results of the inspections, an automatic device for filling the shuttle tube with thread was developed and the operating modes and parameters of the device were substantiated. The working zone of the new device, the determination of the working capacity of the working body - was carried out on the basis of a production test in a small sewing enterprise.

Putting the results into practice. A sewing machine equipped with a newly developed yarn filling device with rational parameters was individually tested at the Bukhara Educational Production Enterprise LLC in entrepreneurial sewing productions. The expected cost-effectiveness of a sewing machine with a recommended additional installed yarn filling device has increased by several percent.

1. INFORMATION ABOUT TYPES OF SEWING MACHINES, WORKING MECHANISMS AND ORGANS, TECHNOLOGICAL PARAMETERS AND RAW MATERIALS

1.1. Types, constructions and technological processes of the main mechanisms of sewing machines.

At present, there are more than 130 sewing machine manufacturers and machine-building enterprises around the world, which specialize in the production of various technological processes and products.

The largest enterprises: Zinger, Shtobel, PFAFF (Germany), Union Special (USA), Rimoldi (Italy), Yamoto, Juki, Seiko (Japan), "Panonia" (Hungary), "Minerva" (Czech Republic), "Rostovshveymash", "Podolskshveymash" (Russia) produce a variety of machines and equipment, devices and devices that meet the requirements of modern world standards.

These modern sewing machines are equipped with highly automated and robotic, microprocessor-based, computer-controlled systems.

The main types of sewing machines are:

- shuttle and chain stitch sewing machines;

- vibrating needle machines;

-spinning needles, forward-reverse moving needles, sewing machines with complex moving needles, etc. In the production of leather and fur, footwear, leather goods and carpets are also used special sewing machines of various designs, designed for the implementation of technological processes [2,3].

The shuttle and chain-link sewing machines consist of the following main mechanisms:

- consists of mechanisms such as needle mechanism, shuttle, mixer, material push, thread puller, kick knot, distributor.

Mechanized mechanisms and devices include: material guides, measuring and roller thrust mechanisms, button transfer mechanisms under the needle, embossing devices, fabric edge cutting mechanisms, sharpening mechanisms, needle cooling devices, and so on.

These devices and mechanisms have different designs and principles of operation, depending on the functions of the sewing machine and the functions of the technological process.

Automated mechanisms and devices include:

- automatic stop device;

- automatic stop of the needle in the desired position;

- cutting yarn and mesh materials with a vertical knife;

- cutting the bottom thread;

- automatic lifting of the reaction after the technological process;

- warning in case of violation of the placement process and thread breakage;

-automatic unpacking of the packaging;

- counter for quantity and size of products, etc .;

- product quality control device and template, drawing tools.

Needle mechanism - serves to perform the technical function of tying and delivering the upper thread with the lower shuttle thread, piercing the layers of fabric sewn through the threaded needle.

1.1. Sewing machines that form a chain saw.

Features of single-stranded and double-stranded chain saws. A single-stranded chain saw is dotted at the top and chain-shaped at the bottom (Figure 1.1). If you pull out the end of the thread from the last bahya and pull it, the bahyakator will open easily. When sewing garments, a single-strand chain stitch

is often used for temporary joining of details (for stitching and stitching), button stitching and button stitch wrapping, loop stitching, stitching for stitching, decorative work, and so on. When sewing hats, a single-strand chain stitch can be used to permanently connect the details, as all the seams in the hats are under the lining, which prevents them from coming off.

A single-thread chain shuttle shuttle is twice as elastic as a shuttle shutter and is resistant to longitudinal pulling of the seam. The efficiency of these machines is quite high, the design is simple, because they do not rewind the bottom yarn, do not have a spinning and spinning device.

Figure 1.1. A single-stranded chain saw

The process of forming a single-stranded chain link fence. In the process of forming the spring, the mixer 3 (Fig. 1.2) is involved with the needle 2, the rail 4, the kick 1 and the needle attached to the needle holder.

The process of Bahia formation can be divided into the following characteristic stages:

- the needle pierces the fabric 2 and falls to the lowest edge position, then when raised 2-2.5 mm forms a loop in the thread, which hangs the end of the ring mixer 3;

- the mixer 3 elongates the ring, the needle 2 comes out of the fabric, the toothed rail 4 rises and pushes the fabric along one stitch;

- at the end of the sliding of the fabric, the ring bends and assumes a comfortable position for the needle 2 to enter, while the sloping surface of the

mixer 3 moves the short (left) part of the ring 5 so that it does not wrap around the mixer 3;

- needle 2 again pierces the fabric and forms a second ring when it rises 2-2.5 mm from the lowest position, into which the tip of the mixer 3 enters;

- the mixer 3 inserts the second ring into the first; the first ring slider 3 slides out of the bottom 6;

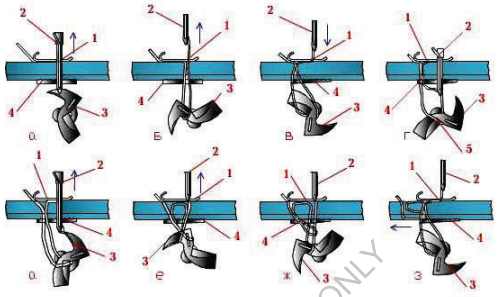

Figure 1.2. The process of forming a single-stranded chain link fence

- As soon as the needle 2 comes out of the fabric, the rail 4 rises and pushes the material along the bahya. The needle 2, the mixer 3, the expanding second ring and the rail 4 are involved in forming the first spring.

Once the steps are done, the process is repeated again.

Properties of a two-strand chain saw. The two-strand chain link (Figure 1.3) consists of a chain of dotted lines at the top and three strands at the bottom. The seam becomes thicker as the underside of the bubble emerges as a bubble.

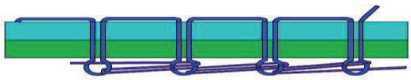

Figure 1.3. Two-string chain saw.

Икки ипли занжирсимон баҳяқатор мокибаҳяқаторга нисбатан икки баробар эластикроқ бўлади. Икки ипли занжирсимон баҳяқатор осонгина сўкилади.

To do this, you need to pull out the end of the mixer strip from the bag: the top thread is cut separately. If the top thread is cut in the middle of the stitch, it will be difficult to cut where the thread is cut. A two-thread chain spinner uses 2.3 times more yarn than a shuttle spinner.

Two-thread chain stitching machines are increasingly used in the sewing industry due to the need to sew items from knitted materials and elastic synthetic fabrics that require high elastic stitching. In addition, two-wire chain bahya machines have several advantages over shuttle bahya machines.

The process of forming a two-strand chain link. A needle, a mixer, a rail, a kick, a threader are involved in the formation of the bahya. The mixer moves in a complex spatial motion, moving twice across the transducer and twice along the transducer (Figure 1.4, a).

The process of bahya formation can be divided into several stages.

Needle 1 (Fig. 1.4, b) pierces the material and falls to the lowest position, at which point the mixer 2 moves across the transducer.

The needle 1 (Fig. 1.4, b) rises 2–2.5 mm from its lowest position to form a ring A1, which brings the ring mixer 2 into its own ring V1.

Needle 1 (Fig. 1.4, b) rises high and comes out of the material, the thread stretcher pulls the thread from the spool to the spool, the rail 3 rises high and pulls the material along the spool. The mixer 2 moves along the length of the stitch (sewing side).

The needle 1 (Fig. 1.4, b) pierces the material and enters the ring V1 of the mixer 2, while the needle ring A1 moves in the transverse direction of the mixer 2, which keeps it in a deflected position.

Needle 1 (Fig. 1.4, b) continues to descend, the thread extender pulls out the thread, the needle ring A1 shortens. The needle tightens the bahya and pulls the front loop thread. The lower thread loosens the lower thread from the transmitter, pulling the needle A1 ring of the mixer toward the material.

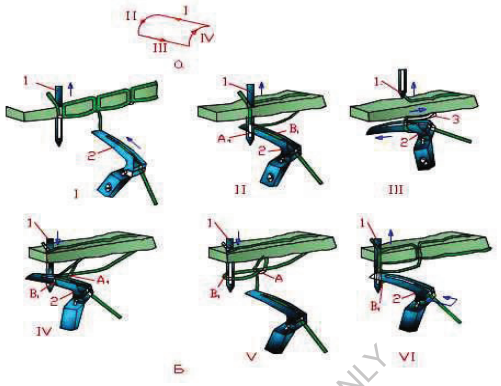

Figure 1.4. Formation of a two-stranded chain saw

a) the trajectory of the mixing motion, b) the formation of the stitch

The mixer 2 (Fig. 1.4, b) moves along the length of the stitch (forward of the stitch), then moves across the stitch and enters the needle ring A2, which rises 2-2.5 mm from the lowest position. Then the process is repeated.

Chain of the firm "Orsha" (Belarus) expensive sewing machines.

The 1622 sewing machine of the Orsha light machinery company is designed to sew a single stitch on the details of the outer garment, as in the case of a single-strand chain with two threads on the left loop. The rotational frequency of the machine head shaft is 1000 rpm. to, the spacing of the left ends on one side is from 6 mm to 12 mm, the length of the left end is at least 4 mm. The maximum thickness of the material under compression is 5 mm. The power of the electric heater is 0.25 kW. Needles 0277 № 90, 100.

The sewing machine model 1622 is composed of a twisting mechanism with an upper curved slide, pushing the fabric, stretching the second lower needle and rings, which are in kinematic contact with the horizontal pushing node of the rail, as well as holding the needles. The needles also act as thread threaders.

The process of creating a copy copy. The upper needle 1 (Fig. 1.5), the upper mixer 2, the lower needle 6, the mixer 4, the rail 5 and the reaction 3 are involved in the process of forming the copy.

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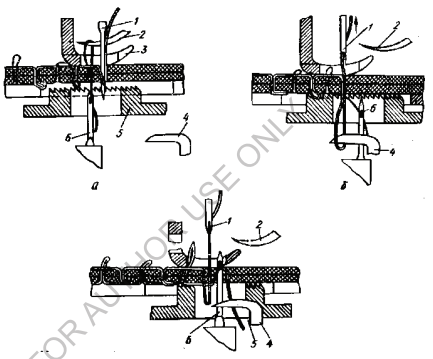


Figure 1.5. Stitch formation

The upper needle 1 goes down and pierces the material; the lower needle 6 holds the ring above the upper mixer 2 materials. The rail is moved 5 times and pushed towards the seamstress. The upper needle 1 falls to the lowest edge position, then rises to a height of 2-2.5 mm and forms a ring, into which the lower needle 4 enters and holds the ring. The upper needle 1 comes out of the material, the upper mixer 2 comes out of the ring of the lower needle 6.

The lower needle 6 rises upwards, piercing the material so that the lower needle pierces the needle 1 about half the length of the hole. At the same time, the rail 5 rises to the top and pushes the material along a ridge. Along with the

rail, the bottom needle 6 is also pushed forward from the seamstress. Needle 6 reaches the top edge position, then drops 2-2.5 mm down and forms a loop from the bottom thread, which is hung by the upper mixer 2 of the ring. At the end of pushing the material, the lower mixer 4 comes out of the upper needle 1 ring. Then the process is repeated.

Tie the bottom thread. To tie the lower thread, the spool of the spool base 8 (Fig. 1.6) is mounted on the rod 7, the thread tension adjuster is rotated between the washers 1, and the thread guide hole 6 is fastened from left to top. The flywheel turns the wheel and lowers the lower needle thread 2, the thread is passed from the bottom to the top of the wire thread guide 5 ear, the thread guide hole 3, the needle 4 is threaded from left to right.

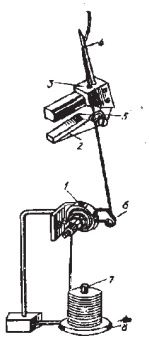


Figure 1.6. Bottom thread stitching on GN1-1D sewing machine

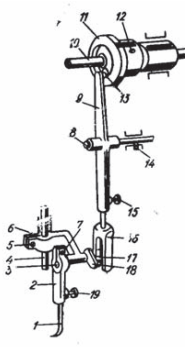


Figure 1.7. Top mixer mechanism

After the threads are tied, the material is placed on the needle plate when the upper needle is raised and the lower needle is lowered below the level of the needle plate.

Top mixer mechanism. To the right of the crank, the pivot shaft 11 is fastened to the main shaft 10 (Fig. 1.7) by means of two support screws 12, to which the roller 13 of the lever 9 is inserted. The lever 9 is mounted on a hinged

finger 8 fastened to the machine body by means of a support screw 14. A fork 16 is inserted into the lower shoulder of the lever 9 and secured by means of a support screw 15. The fork 16 is fitted with a roller 17 that holds the shaft of the crank 18. This crank is made with a bullet 3 inserted into the hole of the handle 6, which is fastened to the stem of the kick 4 by means of a tension screw 5. The handle 2 is fastened to the left end of the shaft 3 by means of a traction screw 7, to which the upper screwdriver 1 is inserted, and by means of a support screw 19.

Under the influence of kulachok 11, the roller 13 is pushed in the direction of the seamstress, while the lever 9 is rotated clockwise at finger 8. The fork 16 turns the crank 18, the shaft 3 and the handle 2 clockwise, the mixer 1 is pushed forward from the seamstress towards the needle.

The agitator 1 is adjusted by loosening the screws 12 of the shaft 11 to come to the side of the needle in time, then turning the head shaft. When making such an adjustment, the tip of the mixer should be 2 mm below the needle eye when the needle falls 2 mm below the maximum position. A gap of 0.02-0.05 mm between the needle and the mixer 1 is set by loosening the screw 19 and then by moving the mixer vertically or by twisting it. Once the screw 5 is loosened, the handle 6 can also be adjusted by vertical or twisting.

The height adjustment of the plug 16 is adjusted by loosening the screw 15 and then pushing it against the lever 9.

The lower needle mechanism. The gear 17 is fastened to the shaft 17 by means of two support screws (Fig. 1.8), and the gear 14 14 is attached to the shaft 13 by means of two support screws. The shaft 13 rotates on a bushing attached to the bulge of the machine platform using a support screw. The left end of the shaft 13 is pressed by a crankshaft 1, and the finger of this crankshaft is

fitted with a slider 2 inserted into the guide of the lever 7. Using the nut 5, the screw pin 4 attached to the frame 3 is attached to the lever 7 along with the lever of the material push mechanism. The rack 11 is fastened to the rack 6 using two clamping screws 9. The lower needle 27 is fastened to the hole of the lever 7 by means of a support screw 28.

The machine used a crankshaft mechanism to move the needle 27 back and forth. When the gear rotates in a clockwise direction for 14 hours, the shaft 13 and the crankshaft 1 also rotate in the same direction, with periodic oscillations in the vertical plane.

Timely vertical movement of the needle 27 is adjusted by turning the crankshaft 1 after loosening the screws of the gear 14.

Bottom mixer mechanism. The lower mixer 8 vibrates across the machine platform. The shaft 15 is fastened to the shaft 17 by means of two support screws, to which the clamp 20 is clamped under the action of a spring. Koromislo 20 is fastened to the bulge of the machine platform by means of a support screw 23 and by means of a traction screw 21 to a vibrating movable shaft 26 on a bushing 22.

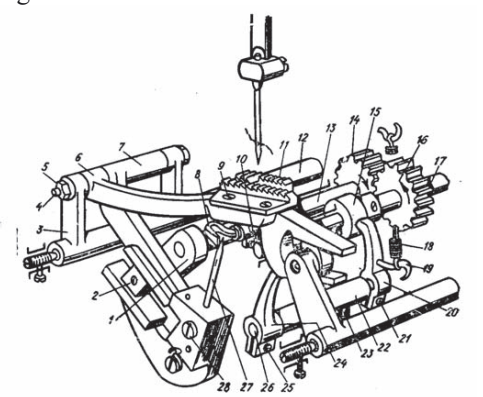


Figure 1.8. Bottom needle and mixer mechanism

The handle 24 is fastened to the left end of the shaft 26 by means of a traction screw 25, the lower mixer 8 is inserted into the hole of the handle by the upper part, and the support is fastened by means of a screw 10.

Under the influence of Kulachok 15 koromislo 20 moves back and forth in the vertical plane.

The tip of the mixer 8 is adjusted by turning the head shaft after loosening the two screws of the pin 15 so that it reaches the side of the needle in time. This should ensure that the bottom needle is 2 mm above the lowest position.

The distance between the needle and the tip of the mixer 8 is 0.02-0.05 mm, as well as the position of the mixer relative to the needle eye is adjusted by loosening the screw 10 by turning the mixer or pushing its axis, or by tightening the handle 24 after loosening the screw 25.

5487 R16980 double needle chain sewing machine from PFAFF

Manufactured by PFAFF, this machine is designed to sew the middle cuts of pants and thick materials with two parallel two-thread knitting needles. The rotational frequency of the main shaft is adjustable up to 5000 min, the size of the shaft is adjusted from 0 to 6 mm, the spacing of parallel needles is 2 mm. The rise height of the base is 8 mm.

The machine has a needle mechanism, two mixers that move in a spatial complex, a rail mechanism that pushes materials. The machine is equipped with a centralized automatic lubrication system powered by a wheel pump.

To tie the upper thread, turn the flywheel wheel, the needles 1 and 2 are raised to the highest position, and the upper thread of the left needle 2 is tied. To do this, the thread coming out of the spool is passed through the stern holes on the top of the spool support, one after the other through the thread guide holes

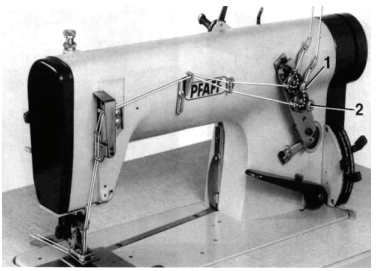


Figure 1.9. Appearance of PFAFF 5487 R 16 980 double-needle sewing machine

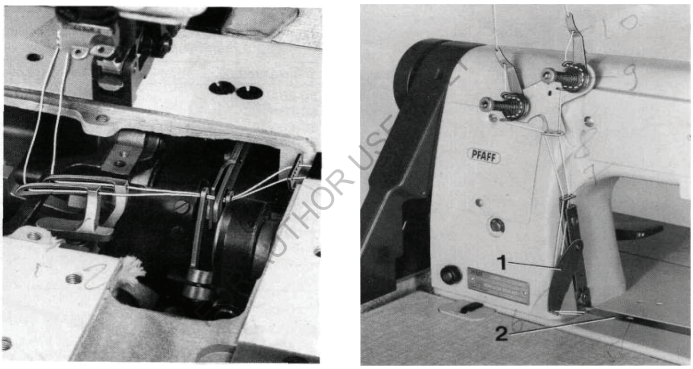
11, 12, and the tension adjuster washers are rotated between 10 and inserted into the thread guide hole 9. and the tension adjuster washers are rotated between 10 and the thread guide hole 9 is inserted. The thread is then passed from right to left through the back hole of the thread guide 8, the threads are inserted into the back hole of the thread guide 7, 6, the wire from the top to the bottom is passed through the loop of the thread guide 5, the thread is passed through the hole of the thread guide 4 attached to the needle holder. 2 is worn in the eye.

The thread is then passed from right to left through the back hole of the thread guide 8, the threads are inserted into the back hole of the thread guide 7, 6, the wire from the top to the bottom is passed through the loop of the thread guide 5, the thread is passed through the hole of the thread guide 4 attached to the needle holder. 2 is worn in the eye.

The thread on the right needle 1 is tied in a similar way. To start sewing, three strands of length 60-70 mm are removed from the threads attached to the needles.

Tie the bottom threads of the mixers (Fig. 1.10, b) 1 and 2 to open the cover on the platform beforehand. Turn the flywheel wheel and place the mixers 1 and 2 in the extreme position on the right. To tie the thread of the next mixer 2, the thread coming out of the spool is passed through the holes in the stem located on the top of the spool support (not shown), the thread guide holes 10 and 11 (Fig. 1.10, a), the tension adjuster washer 9 is entered.

The thread is then passed through the hole of the thread guide 7 through the holes of the plate 6 downwards and through the bottom of the plate mounted lengthwise on the machine platform. The thread (Fig. 1.10, b) is then passed through the holes of the guide 4 and the thread is passed through the conductor 3 through the two holes of the subsequent mixer 2 one after the other. The lower thread is tied to the front mixer 1 in the same way as above. Needles 1 and 2 needles (Fig. 1.10) are fastened to the end of the handle and fastened with screws. The long groove of the needles should face the seamstress. To increase the size of the bag, the handle 13 is raised to the desired number on the scale.



a) **b)**

Figure 1.10. 5487 R 16 980 Tie the bottom thread on a two-needle sewing machine.

1.1. ZINGER and Juki sewing machines

This Zinger machine is designed to sew the details of women's lightweight suits, children's and men's shirts with a three-strand chain stitch. Along with this machine, Zinger manufactures several types of walking machines.

The machine has one needle and two mixers. The rail that pulls the material is a differential mechanism, and the front rail forms both the left and the right of

the material. The blade mechanism works on the principle of scissors. The machine uses an automatic lubrication system using an oil pump (Figure 1.11).

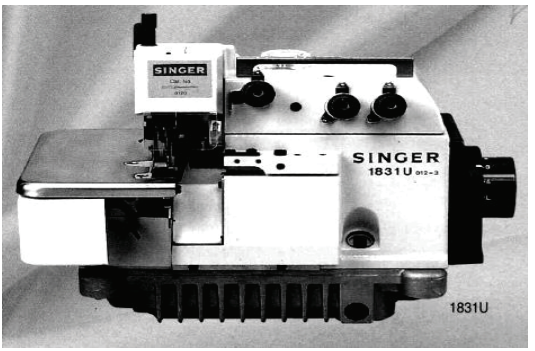


Figure 1.11. Zinger 1831 U 012-3 sewing machine.

Threading. Remove the needle thread from the spool and thread the thread from top to bottom through the hole of the guide lever 1 (Fig. 1.12), the two holes of the angle 2 one by one, pass the thread through the guide bushing 3, turn the thread between the tension adjuster washers 4 and sew the needle from right to left. is inserted under the shield that closes the mechanism. The thread is then passed through the hook of the thread guide 5, the two holes of the thread guide 6, from top to bottom through the bottom of the additional tension adjuster plate 7, directed away from the seamstress, and the needle 8 is inserted into the eye.

Pass the left mixer thread through the spool 9, angle 10 holes, insert the thread guide bushing 11 from top to bottom, thread the thread guide hole 13 through the tension adjuster washers 13, then thread the thread guide bushing 15, and thread the thread guide bushing 15. the router is inserted into the hole 16, the thread from the right to the left is passed through the hole 17 of the router, and

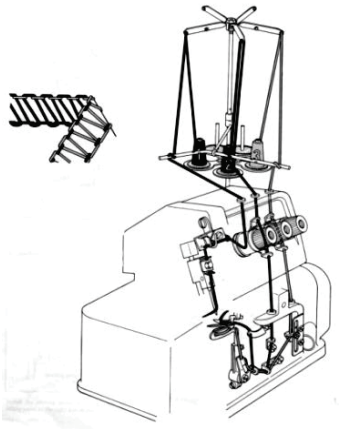


Figure 1.12. Tie the threads to the Zinger sewing machine 1831U012-3

The right spinning thread is passed through the hole of the lever 21 from the back to the front of the coil, through the two holes of the angle 2 through the top-down thread guide bushing 22, inserted into the thread guide hole 23, rotated between the tension adjuster washers 24 and inserted into the thread guide hole 25. the thread from the bottom to the top is passed through the holes 18, 19. Turn the flywheel wheel to bring the left mixer 20 to the left edge position and fasten the thread to the three holes of the mixer using tweezers.

The thread is then passed through the thread guide bushing 26, through the hole of the thread guide 27, from right to left into the back hole of the thread guide 28 and the thread guide hole 29, and through the front thread thread 30. The flywheel turns the wheel, adjusts the right mixer 31 to the right edge, and threads into its hole using tweezers.

MO-2516-DD4-300 of JUKI (Japan) sewing machine.

The Japanese firm Juki manufactures a wide range of sewing machines. The company's sewing machines are widely used around the world.

It meets modern requirements in terms of technological and technical performance of the two-needle crawler machines currently in production.

This machine is designed for sewing women's light shirts, children's clothes, men's shirts, knitwear with a two-strand chain stitch, and at the same time with a three-strand chain stitch stitch.

The rotational frequency of the main shaft can be adjusted to 6500 rpm, the size of the shaft from 0 to 4 mm, the width of the groove 3.2-6.35 mm, the distance between the parallel needles 3.2 mm, the width of the seam 6.4-9.55 mm . DCx27 needles are made in Japan.

The machine has five threads, two needles and three mixers. The rack differential mechanism for pulling the fabric consists of two rails, the front rail of which can form both the left and the stretch of the fabric. Knife mechanisms work on the principle of scissors. The machine uses an electromagnetic device to cut chain strands in fabrics sewn from the bottom of the kick. The machine has a centralized automatic lubrication system, which uses a gear pump that drives the main shaft.

It is possible to sew using different threads on the machine. The needle cooling device protects the needle from overheating even at maximum machine speed. A micro-adjustment system was used in the differential thrust mechanism. The plate under the material can be opened slightly using the control lever.

Threading.. Remove the thread from the spool and thread it from top to bottom through the hole of the thread guide lever 4 (Fig. 1.13), the two holes of the angle 6 one by one, pass the thread guide bushing 9 through the thread tension adjuster washers 15 and turn it to the right. to the left is inserted under the shield that closes the needle mechanism. Then the thread is passed through the hook of the thread guide 14, the two holes of the thread guide 13, from top to bottom through the bottom of the additional tension adjuster plate 49, directed away from the seamstress, and the thread needle 24 is inserted into the eye.

Pass the left mixer thread through the spool 5, angle 6 holes, insert it from top to bottom into the thread guide bush 11, thread guide hole 18, through the tension adjuster washers 19, thread the thread guide hole 20, then through the

thread guide bushing 27 and. the thread guide is inserted into hole 29, the thread guide from right to left is inserted into hole 32, and the thread guide holes 33, 34 from bottom to top. The flywheel rotates the wheel, adjusts the left mixer 26 to the left, and the thread is fastened to the three holes of the mixer using tweezers.

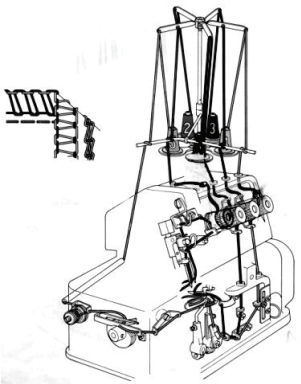


Figure 1.13. Threading on the sewing machine MO-2516-DD4-30 "Juki" (Japan)

Remove the thread from the spool and thread it through the holes 2 and 1 from the top to the front, one by one through the two holes of the angle 6 from the top to the bottom, pass the thread through the guide hole 7, turn it between the tension adjuster washers 8 and thread it down. 12, the right-to-left thread guide is passed through loop 23, then the top-down thread guide thread needle is inserted into eye 46.

The right spinning thread is passed through the bore of holes 3 and 5 from the back and front of the coil, through the two holes of the angle 6 through the top-down thread guide bushing 10, inserted into the thread guide hole 17, by twisting the tension adjuster washers 16 through the thread guide hole 21 is included. The thread guide is then passed through the hole 28, the thread guide 30 is inserted, the thread guide 30 is inserted into the back hole of the thread guide 30 and the thread guide hole 33 is inserted, and the thread guide is passed through the hole 31. The flywheel turns the wheel, adjusts the right mixer 25 to the right edge position, and attaches it to its hole using tweezers

The sewing thread is taken out of the bobbin and passed through the corner 6 holes with the lever 1, the wire is passed from the right to the left through the thread through the pipe 45, through the hole of the thread guide 44, through the

tension adjuster washers 43 and inserted into the thread guide 42. The thread is then passed over the forward thread thread 40 under its right arm, the two holes of the thread guide 39 and 38 are passed forward, and the two holes of the thread guide 37 and 36 are passed from left to right. Turn the flywheel wheel, turn the sewing mixer 36 to the right edge, and use tweezers to fasten the thread to the two holes of the mixer.

Hidden price sewing machines.

The process of forming a single-stranded chain link fence.

In the sewing industry, single-thread concealed shuttle sewing machines and double-thread concealed shuttle sewing machines are used.

The formation of a threaded chain hidden bahya. A curved needle 1 (Fig. 1.14), an embosser under the needle plate 2 and two punches, a mixer 3 and a rail 4 are involved in forming the ring.

When the needle 1 (Fig. 1.14, b) moves 2-3 mm to the left, a ring is formed, the branches of the mixer 3 enter this ring.

Figure 1.14. A threaded hidden chain link

The structure of a single-thread hidden chain saw is shown in Figure 1.14. As you can see in the picture, the upper folded part of the material is pierced by the needle, and the lower part is partially hung by the needle, ie the surface of the lower part of the material is not visible. In addition, the ring a is passed through the material and the ring a is aligned with the line of motion.

The seamstress lowers the bridge by depressing the pedal and places the material on the stitches with the right side facing down. The punches then compress the material to the needle plate 2 (Fig. 1.15, a), and the embosser pushes the material out of the groove of the needle plate. Needle 1 moves from left to right, piercing the upper material and partially hanging the lower. At this point, the mixer is pushed in 3 sewing directions.

The seamstress lowers the bridge by depressing the pedal and places the material on the stitches with the right side facing down. The punches then compress the material to the needle plate 2 (Fig. 1.15, a), and the embosser pushes the material out of the groove of the needle plate. Needle 1 moves from left to right, piercing the upper material and partially hanging the lower. At this point, the mixer is pushed towards the 3 stitches.

When the needle 1 (Fig. 1.15, b) moves 2-3 mm to the left, a ring is formed, the branches of the mixer 3 enter this ring.

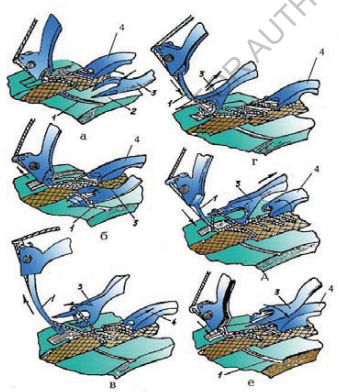


Figure 1.15. The formation of a threaded chain hidden braid

The needle 1 comes out of the material (Fig. 1.15, c) and the mixer 3 moves from right to left along the arc, expanding the needle ring and aligning it with the line of motion of the needle. At this point, the rail 4 falls down and pushes the material along a bale, so that the embosser stops emitting the material.

As the expanded loop moves along the arc, the materials move across the arc of the ring mixer, and the materials are pushed away from the seam so that they are transverse to the seamstress.

The needle 1 moves again to the right (Fig. 1.15, g) and passes between the branches of the mixer 3 and enters its first ring. The mixer moves away from the 3 seamstresses.

Needle 1 pierces the embossed material from the groove of the embossing needle plate (Fig. 1.15, d). Then the previous bahya is pulled for the first time, as well as the reserve thread is pulled from the spool.

The mixer moves from left to right along 3 arcs (Fig. 1.15, e). The needle 1 returns to the right edge position and the mixer 3 moves to the sewing side. When the needle 1 comes out of the material, the bahya is pulled tight. Then the process is repeated.

285 (Russia) sewing machine.

Manufactured by the Podolsk Mechanical Plant in Russia, this machine is designed to sew shirts, skirts and skirts with a single thread. This machine can also be used for folding work. The rotational frequency of the main shaft is adjustable up to 3200 min, the size of the shaft is adjusted from 0 to 7 mm, the thickness of the bending material is up to 3 mm. Needles 0873 № 65.75.

The machine has a vibrating needle mechanism, a complex spatial moving mixer, a rail mechanism that pushes materials, a torsion and a vertically moving vibrating embosser. When the embossing twist moves, the skirt of the garment is bent at each hole of the needle, and when its vertical movement is made with the twisting motion, the skirt of the garment is bent after the needle has been pierced once.

When tying the thread to the machine, lower the thread from the spool and insert the thread guide hole 30 from above (Fig. 1.16), turn the tension adjuster washers 29 clockwise, pass the thread forward hole 28 through the wire thread guide 16. By turning the flywheel wheel 32, the needle guide 15 is brought to the left edge position, the thread thread guide hole 14 is passed from top to bottom, then the wire thread guide 13 is passed, and the needle thread 7 is inserted from the bottom to the top.

The machine is mounted on a special desktop. Its left pedal serves to start the electric friction drive, and its right pedal serves to lower the bridge 3 relative to the needle plate 6. The machine is equipped with a folding tsol 2, which can be turned counterclockwise and removed from the working position for ease of bendingThe guide-line 4 is fastened to the opening by means of two screws, which limits the width of the bend of the skirt. The brake plate 5, which holds the needle plate 6, passes it as the material is pushed away from the seamstress, holding the material when the embosser turns in the direction of the seamstress. So, to sew a skirt or skirt skirt, you need to press the right pedal. In this case, the bridge 3 and the kicks 9 go down together. The kicks are placed on top of the kicks 9 with the right side of the item facing down. The internally bent zi touches the guide-ruler 4. At this point, needle 7 should be in the most extreme position on its left side.

Before sewing the skirt, it is necessary to check the size of the material and, if necessary, adjust it. This is adjusted by turning the adjusting screw 1. If the screw is inserted, the bridge 3 will fall down, which means that the material will be less embossed. Now you can start sewing the skirt by bending it.

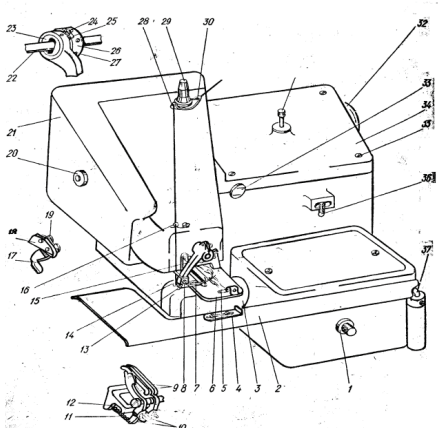


Figure 1.16. 285 sewing machine.

To change the size of the spring, unscrew the nut 20 and remove the cover 21. The screw 27 on the body 26 of the spring adjuster is loosened, and by means of the screw 24 the slider 25 is pushed inside the groove 26 of the body. When driving the slider 25, the eccentric 23 is pushed with it relative to the main shaft 22. The greater the distance between the centers of the main shaft 22 and the eccentric 23, the larger the shaft.

The material coverage of the rail 17 is adjusted by loosening the screw 19 by pushing the rail 18 vertically.

The pressure of reaction 9 on the material is adjusted separately for each reaction.

When the screw 12 is screwed in, the spring 11 is stretched and the corresponding tension increases the kick pressure on the material.

790 sewing machine from PANNONIYA (Hungary).

This machine is designed to sew shirts, suits and coats in both folds and folds, using a single-stranded hidden stitch. The rotational frequency of the main shaft is adjustable up to 3500 min, the size of the shaft is adjusted from 3 to 7

mm, the thickness of the materials in the compressed state at the bottom of the kick is up to 3 mm. Needles 3669E № 70-110 (manufactured in Hungary). The machine has a vibrating needle mechanism, a complex spatial moving mixer, a rail mechanism that pushes materials, a vibrating embosser, and two push-pulls. The difference between this machine and other concealed bahya machines is that it does not have a swivel bridge, instead a cylindrical platform 4 (Figure 1.17) is used. This allows you to sew virtually all folding and bending sewing operations, even cylindrical parts with a diameter of more than 60 mm.

Tie the strings. The thread falling from the spool is inserted into the thread guide hole 21 from top to left, rotating counterclockwise between the tension adjuster washers 20, through the thread thread guide hole 19 and the thread guide tube 15. Turn the flywheel 23 to the left edge of the needle drive and pass it through the thread guide hole 14 of the press plate, then from bottom to top the needle 11 is inserted into the eye. then held as shown above.

Machine operation and basic adjustments. The machine is mounted on a special work surface and has a pedal; the one on the right is connected to the lever 25 by means of a drawbar, which serves to turn the relief 9 and lower the kick, while the one on the left serves to start the friction drive of the machine. For ease of operation, the machine is equipped with an opening hinge 8, which can also be removed from the working area. The needle plate 6 is attached to the guide-line using a screw 10 at the bottom of it. It is used for sewing. A stopper 1 enters the needle plate groove, which stops the material from sliding when the embosser is turned in the sewing direction.

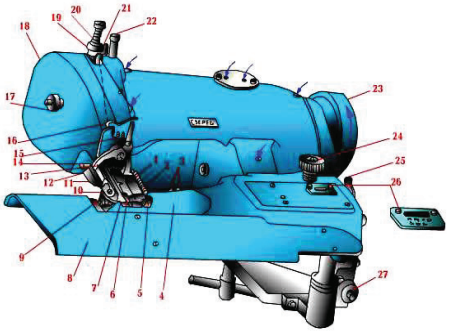


Figure 1.17. 790 sewing machine

To replace the needle 11, turn the flywheel wheel 23 to bring the needle drive to the left edge position, and set the needle 11 by turning the short groove 13 of the screw upwards. The height of the embossing of the material is adjusted by turning the handle 27.

If the handle rotates clockwise, the material will bulge more, the handle 27 has a graded scale to more accurately set the height of the bulge. The material coverage of the rail 12 is adjusted as in the 285 sewing machine.

When adjusting the size of the knob, press the button 22 and the flywheel 23 will rotate in the direction of its rotation until the rod of the knob 22 is lowered. The flywheel is then rotated in a 23-hour spindle motion until a clicking sound is heard again. A clicking sound indicates that the magnitude of the tick has changed. Thus, in a single rotation of the main shaft, four different baffle sizes from 3 mm to 7 mm can be formed.

After setting the baffle size, the button 22 is released. He must rise under the influence of his spring. The pressure of the thrust on the material is adjusted by means of a screw 3, in which case the left screw 3 serves to change the lower thrust pressure, and the right screw 3 serves to change the left thrust pressure. If the screws are tightened, the kick pressure will increase. The pressure of the stopper plate 7 is adjusted by changing the pressure of the spring 1 using a screw 5. When the screw 5 is tightened, the nut 2 extends the spring 1 and the pressure of the brake plate 7 on the material increases.

After loosening the screw 10, the position of the guide-ruler during the bending operation is adjusted by pushing it across the needle plate 6.

When sewing the skirt of the item by bending, it is possible to sew the needle after each hole, one, two, three times, because this machine has a special interval mechanism. Four pazi head shchit 26 made 0.1: 1, 1: 2, 1: 3 divisions from right to left. Division 0 corresponds to the material bulging with each puncture of the needle, division 1: 1 corresponds to the material bulging after each puncture of the needle, and so on. To move the pointer button 24 to the next slot of the switch 26, press the button 24 and it will turn to fit the division of the switch 26.

Lubrication of the joints of the parts with manual lubrication is used in conjunction with individual lubrication.

All but the two lubricated areas on the back of the machine body are indicated by an arrow in the figure. The connections of the needle, mixer, and material push mechanism parts are lubricated manually using a paddle by removing the cover 18 after loosening the nut 17.

2. COMPARISON OF CONSTRUCTIONS OF SHOCK AND EXCHANGE MECHANISMS

2.1. Designs of sewing machines shuttle and mixer mechanisms

A complex of machines, mechanisms and transport equipment is being developed to mechanize the work in the preparation and tailoring departments of production. New machines are being introduced to detect fabric defects and accurately measure height and width. The design of garments was developed on a mathematical basis, and electronic computers became available. Programmable electronic control systems are used in cutting garments with laser beams, ultrasound, high-frequency electric spark.

Sewing machines are widely used, which allow you to perform several technological processes at once.

Currently, the following is being developed and conducted research on complex mechanization and automation of sewing departments:

- Introduction of semi-fully and fully automated special mechanisms for auxiliary and manual work in the process of sewing garments;

- Development of automatic transmission mechanisms that deliver the cut parts to the sewing site and take the sewn part from the machine and transfer it to the next process;

- Introduction of electronically controlled and automatic sewing machines for quality control;

- Development of a set of special devices and machines for sewing the main details of clothes;

- automation and control of heat and moisture treatment of products;

- the use of special machines and small mechanized complexes that perform several tasks at once.

Of course, along with the development of the garment industry, the industry will need to provide highly qualified, mature professionals who meet modern requirements.

Nowadays, artists-designers use different colors in the design of a new car in the design process with designers. Artists and designers in all countries have noted that the use of light colors in the painting of equipment, workshops can significantly increase productivity. They also found that cars were easier to drive when each part was a different color.

Particular attention is paid to the requirements of ergonomics in the creation and improvement of machines, automatic and automatic rows belonging to the sewing industry. These requirements include ease of selection, operation

and maintenance of the machine control device or electronic apparatus, marking and preparation with computer records.

At present, automated and electronically controlled sewing machines, which are different in terms of function and structure, are based on the latest achievements of science and technology, meet the requirements of modern technology.

The sewing machine consists of the following main parts. The machine body 2 (Fig. 2.1) is mounted on the main shaft, from which motion is transmitted to all mechanisms of the machine. At the base 4 of the machine body are devices that change the size of the bahya. It basically holds the head of the car. The front of the machine is equipped with 1 needle and thread mechanism (thread threader on chain sewing machines), and on some machines with an additional mechanism and knots.

The rotational motion on the main shaft of the machine is transmitted from the electric drive through the flywheel 3. The control panel 5 is mounted on the machine, which automatically changes the position, appearance and size of the working bodies.

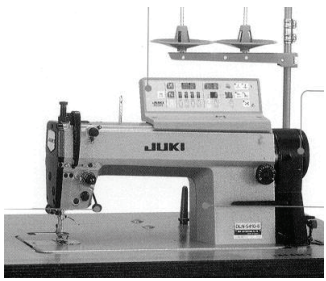


Figure 2.1. Juki sewing machine.

In modern sewing machines, the control panel is located on the base of the machine body or on its side. The machine is mounted on a base 6 on the desktop,

on which are placed rods for spools or spools. The a-distance from the body support 4 to the needle line is called the working arm of the machine.

The machine platform 7 is equipped with additional mechanisms such as a shuttle (mixer on chain-link sewing machines), pushing and automatic lubrication mechanisms, some sewing machines such as thread cutting, expander. Sewing machines are very diverse in terms of appearance, function, working principle, technical performance, kinematics, design.

In the creation and improvement of sewing machines take into account the physical and mechanical properties and structure of the sewn material, the factors influencing the technological process. Parameters of the sewn material, such as coefficient of friction, elongation, density, melting temperature, depend on the design of the sewing machine, the bonding of yarns in the formation of the yarn, the geometry of the needle used, the speed of the machine. Sewing machines are divided into two groups depending on the nature of the yarn weaving process:

- shuttle sewing machines;
- chain sewing machines.

Due to the low elongation and stiffness of the shuttle stitch, sewing machines with a shuttle stitch are mainly used for sewing hard and durable fabrics.

Chain-forming sewing machines are designed to sew stretch knitted fabrics and temporarily join garment details.

Sewing machines are divided into the following groups according to their function:

- sewing machines with shuttle-shaped straight stitches;

Types of shuttle mechanisms are shown in Figure 1. As can be seen from the diagram, there are vibrating and rotating moving shuttles.

Vibrating moving shuttles include right and left twisting shutters. If the working motion of the right torsional moving shuttle is clockwise, the number of transmissions from the needle to the vibrating moving shuttle is 1:1.

Rotary moving shutters are mainly used in high-speed industrial sewing machines. The axes of rotation are horizontal and vertical shutters. On household sewing machines manufactured by Nekki (Italy), the shuttle is positioned at a 45-degree angle to the horizontal plane. The number of transmissions from the main shaft to the shuttle shaft can be 1: 1 and 1: 2.

In some cases, shuttle constructions with a ratio of 1: 3 are also encountered. Rotating shutters can be flat and unevenly rotating. The mixing mechanism was used in chain-link sewing machines. Mixers are divided into the following in terms of movement:

- moving in a straight line and arc in one plane;
- linear and arc motion in space; Expanders are divided into:
- rotating and oscillating in space;
- oscillating or rotating in a single plane.

The interdependence of needle, thread and material in the formation of shuttle prices. On sewing machines, the shutter is made in the presence of a needle, shuttle and thread. Consider the position of the needle in the forward-reverse motion. During the injection of the needle into the material, the upper thread is located at an angle from the top to the bottom of the needle eye. The needle is inserted into the fabric and continues to move downwards. In this position of the needle, the upper thread is located longitudinally relative to the line of the needle and the axis of the needle eye. On some sewing machines, the

needle is inserted into the material so that the thread is transverse to the needle eye and the sewing line.

When the needle rises 1.5-2 mm from its lowest position, an upper ring is formed and the shuttle tip begins to hang around it. The needle continues its upward movement, and the thread bends at an angle. When the needle assumes the upper position, the thread pulls the ring and tightens the resulting stitch. The toothed rail, on the other hand, pushes the material to a certain length.

Proper selection of the needle according to the material to be sewn is important in creating a quality seamstress. The needle should be inserted without damaging the material.

For this requirement to be met, the material threads and needle numbers must be selected correctly. The cross-section of the needle rod should correspond to the distance between the rings of material threads. The cross-sectional area of the needle for knitting materials Water is found as follows:

$$S_u = (S_p - S_н)\ K$$

here: S_p - ring face in mm in the pulled position of the knitted material, $S_н$ - the surface of the thread in the ring;

K is the coefficient of correlation between the drawn ring and the cross section of the needle.

$$S_p = 1{,}57\ AB$$

here: A - ring step;

B - the height of the row of rings;

P2 - 50 mm knitted density on the horizontal;

Pв - 50 mm vertical knitting density;

1 - ring length.

The function of shuttle mechanisms. The shuttle mechanisms on each sewing machine are the main mechanisms, which, in addition to hanging the needle formed on the side of the short thread, expand it and rotate themselves around the thread on the spools and mix with it.

Shuttle mechanisms are divided into central roller, non-central roller, as well as rotating in a plane parallel to the vertical plane and rotating in a plane parallel to the horizontal plane. Torsional shuttle mechanisms are also known.

1022, 1022-M, 97-A, 220 and 862 class machines shuttle mechanisms

The following are the kinematic diagrams of the shuttle mechanisms of the class machines shown.

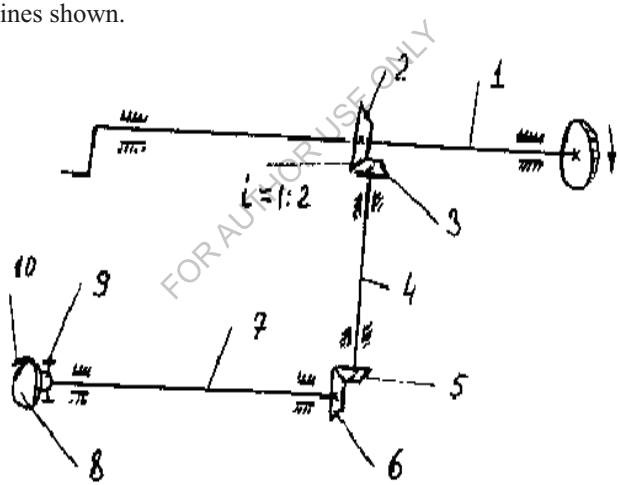


Figure 2.2. Schematic of the shuttle mechanism of the 1022 class machine.
In the picture: 1 main shaft. 2,3,5,6 - conical gears. 4-vertical shaft. 7-shuttle vali. 8-shuttle. 9 fixing screws. 10-shuttle nose.

When the main shaft rotates 1 clockwise, gear 3 also rotates clockwise, which in turn rotates shaft 4 and gear 5 in the same direction, resulting in 6 gears rotating counterclockwise and 8 gears rotating in the same direction. When the

main shaft rotates once, the shuttle rotates twice, the first time it makes a working movement (mixing the needle thread with its own thread), the second time it turns the salt.

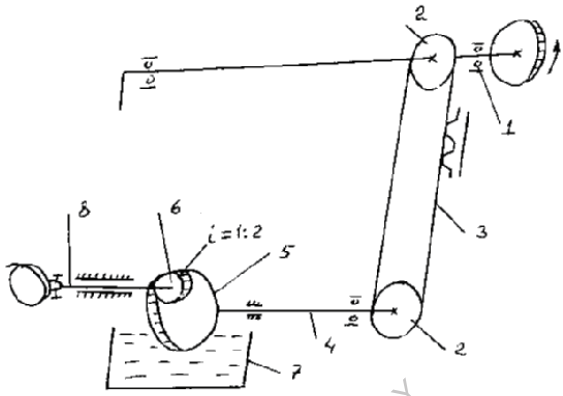


Figure 2.3. 97-A class machine shuttle mechanism diagram

In the picture: 1 rolling bearing. 2 gear drums. 3 gear belt. 4-horizontal shaft. 5 internal gear shesternya. 6 external gear wheel. 7 oil pan. 8-shuttle shaft

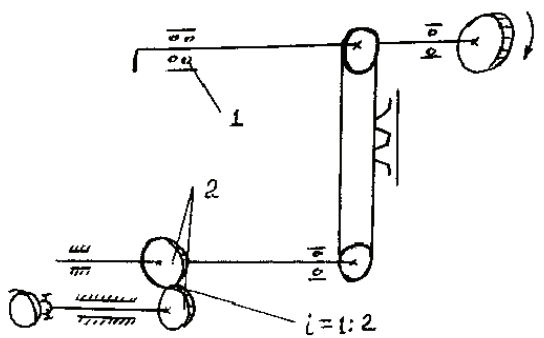


Figure 2.4. Schematic of the shuttle mechanism of a 1022-M class machine.

In the picture: 1. Two-row rolling bearing. 2. External gear coupling.

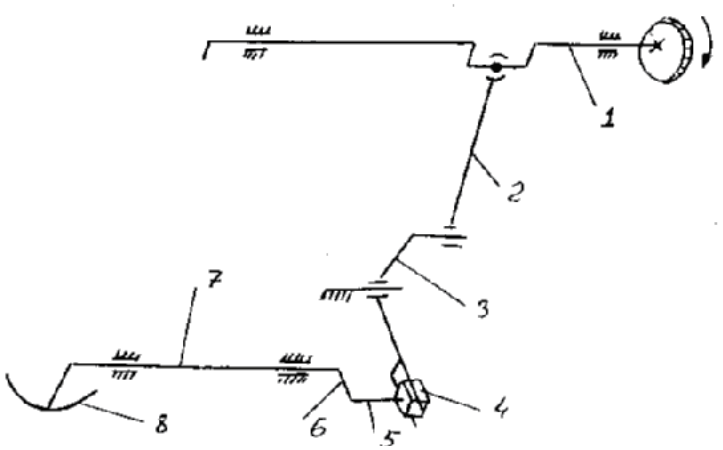


Figure 2.5. Schematic of a 220 class semi-automatic shuttle mechanism

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In the picture: 1-crankshaft. 2-shatun. 3-split two-shoulder lever. 4-slider. 5 fingers. 6-koromislo. 7- shuttle shaft. 8 shuttle drive (carriage).

When the main shaft elbow lifts the connecting rod 2, the 3 levers rotate counterclockwise, resulting in the use of 4 sliders and 5 fingers to turn the 7 shuttle shaft counterclockwise with 6 cores, while the 8 shutter drive shaft (not shown in the diagram) turns counterclockwise. Conversely, when the head shaft 1 pushes the elbow 2 shaft downwards, the 8 shuttle turns the drive shaft clockwise.

The turning angle of the shuttle drive can be changed around 206-210°. Rotary rotary shuttle mechanisms are used in Class 1, Class 2-M, Class 100, Chayka-116, Chayka-134, Chayka-143 home sewing machines, in addition to the 220 class sharpening semi-automatic.

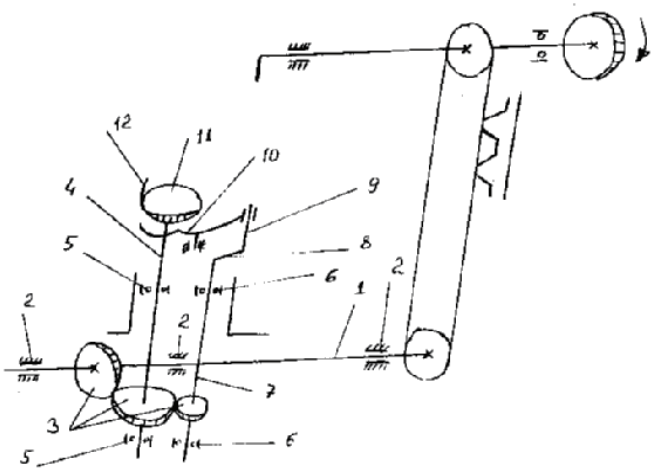

Figure 2.6. Schematic of the shuttle mechanism of the 862 class machine.
In the picture: 1-horizontal shaft. 2 routers. 3 External gear couplings. 4- shuttle shaft. 5,6-rolling bearings. 7 Exhaust shaft. 8- curvature. 9- th finger. 10- th exciter lever. 11- shuttle. 12- shuttle nose

Settings in shuttle mechanisms:

These mechanisms provide for two different settings.

1. Adjust the timing of the shuttle nose to pick up the cold formed on the side of the needle short shaft. When the needle rises 1.5-2.5 mm from the lowest point, the nose of the moki should be in the line of movement. If it arrives late, it won't pick up the leftovers - the machine won't sew, if it arrives earlier, the needle may break or the machine may drop.

This is done by loosening the 9 screws (Fig. 2.6) and turning the 8 shutters clockwise or counterclockwise around the 7 shutters.

2. The distance between the shuttle nose and the needle should be 0.1-0.15 mm. If this distance is large, the machine will not sew, if it is small, the shuttle will break the nose by touching the needle.

This adjustment is again done by loosening the 9 screws and pushing the shuttle 8 to the left or right along the shaft 7.

Differences and advantages of mechanisms

The mechanism in the 1022 class machine is designed to transmit motion from the head shaft to the shuttle via gear couplings, which allows the mechanism to operate in more noisy conditions.

On Class 1022-M, 97-A, 862 machines, the movement of the shuttle is transmitted from the main shaft via gear belts, which significantly reduces noise, but because the belts work on elongation, they sometimes need to be replaced quickly if they become worn.

In addition, the 97-A class machine uses a pump system that automatically delivers oil to all friction joints in the machine, as well as to the shuttle. This prevents the parts from overheating, increases their service life, and reduces noise.

2.2. Traditional ways of filling the shuttle thread of universal sewing machines

Tie the top thread. The thread from the bobbin is passed from right to left through the wire rope guide (10) (Fig. 2.7), between the auxiliary tension adjuster washers (9), from right to left between the main tension adjuster washers (8) and the thread tensioner spring (7).) and the thread is passed behind the guide hook (6) (Fig. 2.7). The thread is then inserted from right to left through the ear of the thread puller (5) into the thread guide bracket (4), passed through the bottom of the plate spring (2) attached to the needle guide (3) and inserted into the eye of the needle (1) from left to right.

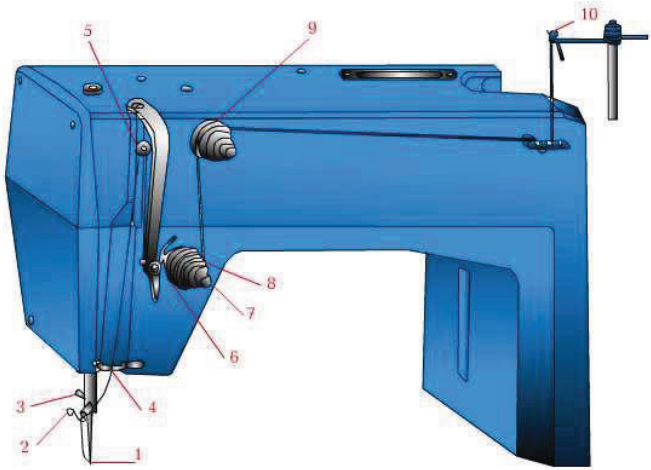

Figure 2.7. Tie the top thread to the CS-1652K-303A semi-automatic

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Tie the bottom thread. When the tube (1) is mounted on the tube cover (2), the thread (3) must be twisted in a counterclockwise direction (Fig. 2.8, a)

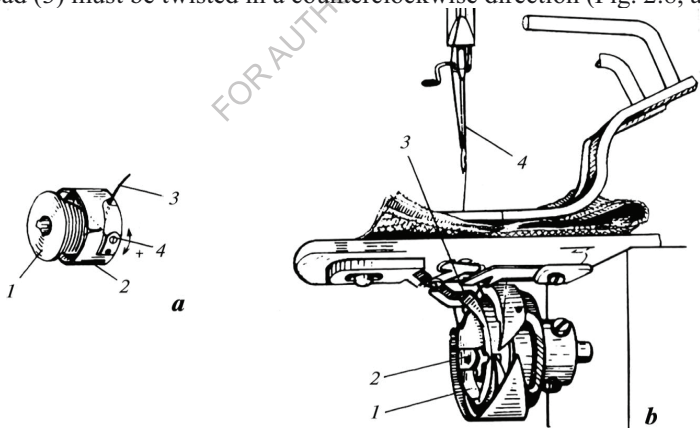

Figure 2.8. Tie the bottom thread to the CS-1652K-303A semi-automatic

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The thread (3) is passed through the groove in the tube cap and under the tension plate and through the hole in the tube cap. The tension of the thread is adjusted by turning the screw (4) on the tube cover.

The threaded tube device (1) is inserted into the center rod (2) of the shuttle. If the bottom thread is filled incorrectly, the needle selection is incorrect, the needle (4) is incorrectly mounted on the needle drive, or the distance between the shuttle tip and the needle (4) is increased, the bottom thread will break.

In this semi-automatic machine, which has a high labor productivity, if you choose the right needle and thread for the fabric you are sewing, you will get a beautiful and accurate seam. The thickness of the thread should correspond to the thickness of the fabric being sewn. To replace the needle, bring the needle holder to the maximum position and loosen the needle holder screw. The needle is then inserted into the hole of the handle holder to the end.

Wrap the bottom thread around the tube and tie. The bottom thread is wound on the tube 26 using an automatic winder 24. To wrap the lower thread from the spool to the tube, it is passed from bottom to top behind the guide hook of the spool handle, as in tying the upper thread, then the thread from top to bottom is inserted into the right hole of guide 13, the tensioner is rotated clockwise between the washers 14; the yarn is passed through three holes of the guide 13 upwards one after the other, and the tube 26 is wound several times by turning it counterclockwise.

Press the spindle 25 lightly and attach the tube 26 to it. At the same time, the separator rotates in a 23-hour spindle motion, enters the tube 26 between the walls, and keeps the spindle 25 in working position.

Before using the machine to wrap the thread into the tube, the thread is removed from the eye of the needle 17 and the knob 2 is raised by turning the lever 3 in a clockwise direction. The electric drive is activated by lifting the handle at the bottom of the right side of the spool table cover. When the pedal is depressed, the rotational motion from the electric drive is transmitted to the machine's flywheel 15 and the main shaft by means of a belt drive. The spindle 25 stops after a sufficient amount of thread is wound on the tube 26. The tube 26 is removed from the spindle 25, leaving enough thread tip to remove the lower thread from the shuttle device.

When placing (tying) the lower thread, the tube 5 (Fig. 2.9) is held in the right hand and the hollow rod 7 of the tube cap 6 in the left hand is placed. Insert the end of the thread from the tube cap into the groove 10, and when the plate-shaped spring 8 is brought to the bottom, its tongue is moved behind the 11. The sliding plate 12 is pushed to the left and the needle 14 is raised by turning the flywheel, the kick should also be raised.

Pull the tube cap lock plate 4 to the left with the left hand and place the tube cap on the rod 3 of the tube holder 1 from the space between the walls of the slide plate 12 and the needle plate 15 so that the tube cap shear 2 is facing upwards. It is checked that the plate 4 does not squeeze the bottom thread and how tightly it is closed by the stem 3. Make sure that the bottom thread comes out of the tube cap without shaking, and then the sliding plate 12 is pushed to the right. By pressing the end of the upper thread and turning the flywheel, the needle 14 is lowered. The shuttle wraps the top thread around the tube cap, tightens it, pulls the bottom thread up, and pulls the bottom thread together with the top thread 13. By placing a cloth between the threads at the bottom of the kick 13, the kick is lowered and the stitching begins.

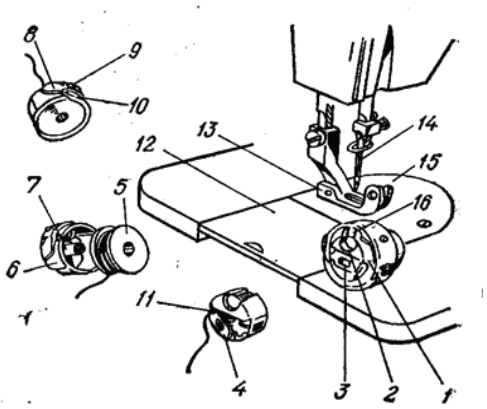


Figure 2.9. Tie the bottom thread on a 1022-M sewing machine

Automatic device for winding yarn on a shuttle sewing machine V 292-185082 from Durkopp (Germany).

This device is mounted on the body of the machine. From the right to the left of the spool, the thread is inserted into the hook of the thread guide (see Figure 2.10), the thread guide thread is inserted into the 12 holes. The threaded tube 13, which is twisted several times, is attached to the spindle 14.

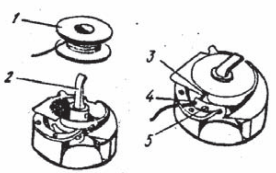


Figure 2.10. Tie the bottom thread on the V 292-185082 machine

When the machine starts, the thread begins to wrap around the tube. After wrapping the required amount of yarn in the tube, the tube presses the limiter 15 and the device stops automatically

2.3. Construct a wire transfer diagram.

The work done by the weaver is characterized by the length of the yarn that is transmitted during the formation of a single yarn. Depending on the design parameters of the needle and shuttle mechanisms and the technological requirements, a thread diagram is constructed, which is consumed for the bite of the bit. The needle is brought to the top position to construct the thread transfer diagram. When the needle moves downwards and touches the material being sewn, the thread passed is half the length of the stitch. Intensive transmission of the upper thread begins with the needle piercing the material.

The length of yarn consumed when the needle reaches its lowest position can be determined from the following formula:

$$l_1 = 2h_н + 2\Delta + \frac{1}{2} l_б$$

here: Δ - the thickness of the material being sewn;

$l_б$ - stitch pitch;

hн- the distance from the needle eye in the lowest position to the level of the needle plate

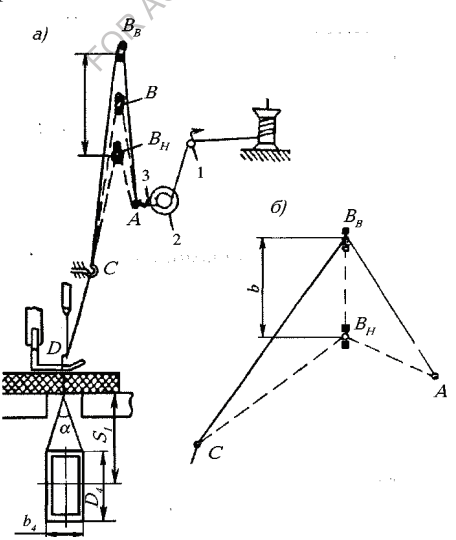


Figure 2.11. Thread transmission scheme

The length of the transmitted thread does not change until it rises from the lower position of the needle and the shuttle tip hangs on the ring. Once the shuttle tip hangs the needle thread loop, the intensity of the transmitted thread length increases.

I.I. the length of the thread required for the shuttle to twist the needle thread around itself. Cabbage can be determined using the formula:

$$l_2 = b_м + 2D_г + 2(S_1 - \frac{D_м}{2})\frac{1}{\cos\alpha}$$

here: bм - shuttle width;

Dм- shuttle diameter;

C_1- distance around from the axis of the shuttle to the stitch plate;

α- thread angle

.

The total length of the yarn to be passed during the bahia formation process is as follows:

$$l_{ум} = l_1 + l_2 = \frac{1}{2}l_б + 2h_н + 2\Delta + b_м + 2D_м + 2(S_1 - \frac{D_м}{2})\frac{2}{\cos\alpha};$$

ёки

$$l_{ум} = 2\left[\frac{l_б}{4} + h_н + \Delta + \frac{l_м}{2} + D_м + (S_1 - \frac{D_м}{2})\frac{1}{\cos\alpha}\right]$$

Once the total length of the rope is determined, the trajectory (path) of motion of the rotor eye is found. To do this, the method of tying the top thread to the machine must be taken into account. The yarn from the spool is passed through the spool eye (V) through the spool (1) (Fig. 2.11, a), the tensioning device (2) and its spring (3) and the spool A. The yarn is then passed through the yarn C and tied to the igaa eye.

To determine the path of motion of the absorber eye by the graphical method, we obtain the dimensions of the AV and VS threads in a single plane.

We denote the highest position of the absorber eye by the point Vv and mark the point Vn by making a cut along the vertical. The path of motion of the absorber eye is equal to the b-section.

From this drawing you can find the total length of the rope:

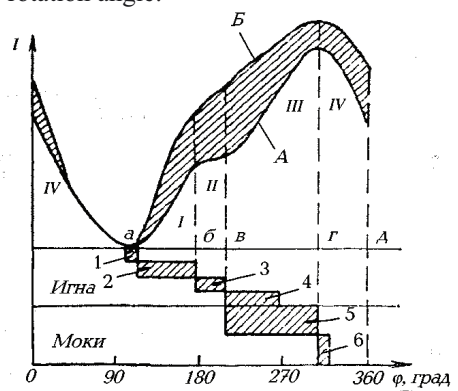
$$L_{ум} = (AB_{ю} + CB_{ю}) - (AB_{к} + CB_{к})$$

After determining the length of the upper thread, we draw a graph of the change in the length of the thread consumed relative to the angle of rotation of the machine head shaft (Figure 2.12).

As can be seen from the graph, the transmission of the rope starts from point a. When the needle falls into the shuttle position (at point b), the thread l1, the length of the thread is required. The thread was not stretched from point b to point c. The length of thread to be consumed after the shuttle tip hangs on the needle thread ring is given by the following formula:

$$l_2 = (D_м + b_м) \sin\frac{\varphi}{2}$$

φ - shuttle rotation angle.



1-piercing the needle to the tissue; 2-carrying the thread through the material; 3- loop formation; 4- exit the needle from the fabric; 5- loop extension; 6-loop out of the shuttle

2.12-**расм. Сарф бўладиган (А) ва узатиладиган (В) иплар диаграммаси.**

If the shuttle turning angle is precise, it is possible to draw a line defining the consumable thread in the v-g section. Part g-d of the graph A in the diagram shows the exit position of the ring from the shuttle end. The length of yarn A consumed in the formation of the yarn depends on the working path of the needle in the fabric and the size of the shuttle. The V graph showing the transmitted yarn is constructed according to the thickness of the fabric and the maximum pitch of the yarn. On sewing machines with a broken stitch, the thread transfer diagram is constructed in the same way. Only the distance of the needle to the width of the needle is also taken into account, and the length of the transmitted thread in part III of the diagram is determined from the following formula:

$$\Delta l_3 = \sqrt{l_{b\max}^2 + b_{\max}^2 + \delta}$$

$l_{б.max}$ - largest stitch pitch;

b_{max} - maximum transverse needle shift;

δ - excess thread length (δ =3-5 mm). If one completed cycle of threading between adjacent holes in the fabric forming a needle is done manually, it is called a loop, and if it is done on a machine, it is called a bahya. From a series of repeated stalks, a stalk is formed, and from the stalks, a stalk. Depending on the way of weaving the yarns made on the machine are divided into mokili and chain types.

In the garment industry, the shuttle lines. is the most common in sewing clothes, it is a two-thread one-way shuttle lines and a two-thread broken lines. The lines formed using a shuttle consists of two strings. The top thread is called the “needle thread” because it passes through the material along with the needle eye. The bottom thread is called the “shuttle thread” because it comes out of the tube in the shuttle. These threads run between the material. In a one-way lines, the lines will be located one after the other.

The joints of the broken joint will be at an angle to each other.

Chain weavers used in sewing include: single-strand and double-strand single-strand weavers, double-strand and three-strand weavers; includes a broken chain-stitch stitch that is threaded and twisted.

The threads of the chain weavers run through the surface of the fabric.

A two-thread shuttle splitter and a three-thread sprocket splitter can also be performed together, or a single-span sprocket splitter can be performed together with a two-spindle sprocket splitter.

3. Theoretical and experimental studies of the calculation of the time spent on thread and yarn filling on a sewing machine

3.1. Experimental study of the effect of shuttle parameters on tube replacement time and needle thread stiffness

Labor productivity, durability and quality of the sewing machine depend mainly on the design of the shuttle mechanism. The shuttle parameters affect the tube replacement time, the needle thread stiffness.

Suites can be conditionally grouped according to location, movement, appearance, and tube structure.

1. Divided into the following groups by location:
   a) shuttles located in a vertical plane with the axis of rotation horizontal;
   b) shuttles located in a horizontal plane with a vertical axis of rotation;
   c) shuttles located under the platform.
2. The movement is divided into:
   a) forward-reversing shuttles;
   b) rotary shutters;
   c) rotary shutters

3. There will be shuttles in the following views:

a) cylindrical shutters are mainly used in low-speed household sewing machines;

b) rotary shutters are vibrationally movable and are more commonly used in semi-automatic sewing machines;

c) lycopene shutters are mostly flat rotating and are mounted on tube holders. Such shutters are widely used in high-speed sewing machines.

The shuttles can be centered or decentralized. The shuttle path coefficient Km is important in the shuttle price formation process and can be found by the following formula:

$$K_м = \varphi_м / \varphi_0$$

here: $\varphi м$ - the angle of rotation of the main shaft from the moment of hooking of the needle thread ring for the shuttle until it is rotated around it;

$\varphi 0$ - the full turning angle of the main shaft.

On sewing machines, the Km coefficient is in the range of 0.25 -0.42. The main technological disadvantage of the shuttle device is that it takes a long time to replace the tube. Figure 3.1 (a) shows a graph of the time taken to replace the tube (1) and the time it takes to tie it when the thread breaks (2), as well as the dependence of machine labor productivity Q on the tube size Vn (3).

Studies show that the stiffness of the thread is equal to the ratio of the length of the thread twisted around the shuttle L_m to the length of the needle thread L_b consumed per bach:

$$K_ц = L_м / L_б$$

The length of the needle thread to be used for one stitch is found as follows:

$$L_б = (C + \Delta)\ \eta_т$$

here: C - sewing pitch;

Δ - the thickness of the material to be removed;

η_T - stitch tension ratio.

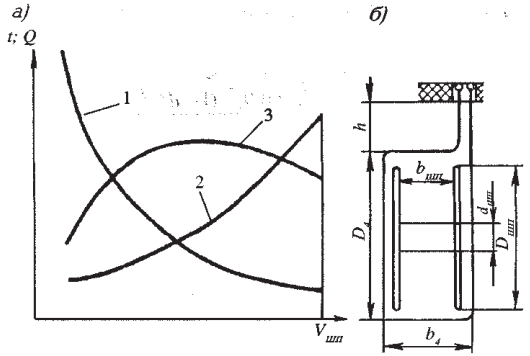


Figure 3.1. The time taken to replace the tube t and the labor productivity Q are the graph of change in tube volume Vn relative to Vn (a), as well as the diameter section of the shuttle (b).

We determine Lm from the diametrical section of the shuttle

$$L_м = 2\,K_0\,(D_м + b_м + h);$$

or

$$D_m \pm b_m = P = \frac{L_M - 2n_0h}{2K_0}$$

here: n_0- a coefficient indicating that the shape of the ring deviates from the allowable;

h - is the distance from the trajectory of the shuttle to the needle plate;

P - shuttle parameters.

The volume of the tube is found by the following formula:

$$V_n = \frac{\pi}{4}(D_n^2 - d_n^2)b_n$$

here: $D_н$ and $b_н$ - bobbin diameter and width;

$d_н$ – bobbin shank diameter

The operating time of the sewing machine in the tube replacement interval is determined by the following formula:

$$T = \frac{60\,L}{l_{cm}\,n} = \frac{60\,D_n^{\,2}(1-d^{2})b_n}{d_n l_u n}\xi_{\overline{YP}}$$

here: H- number of lines of education for one minute,

Da- thread diameter

3.2. Results of experimental studies of the proposed yarn filling device

Before using the machine to wrap the thread into the tube, the thread is removed from the needle eye and the kick is lifted by turning the knob in a clockwise direction. The electric drive is started by lifting the handle at the bottom of the right side of the desktop cover

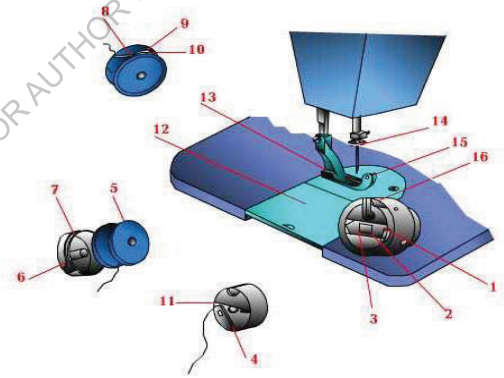


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Figure 3.2. Tailor on a 1022-M sewing machine detailing scheme

When the pedal is depressed, the rotational motion from the electric drive is transmitted to the car's flywheel and main shaft via a belt drive. After a sufficient amount of thread is wound into the tube, the spindle stops. The tube is removed from the spindle, leaving enough thread tip to remove the bottom thread from the

shuttle device. When placing (tying) the lower thread on the shuttle, take the tube (Fig. 3.2) in the right hand and put it on the hollow rod 7 of the tube cap 6, which is in the left hand. Insert the end of the thread from the tube cap into the groove 10, and when the plate-shaped spring 8 is brought to the bottom, its tongue is moved behind the 11. The sliding plate 12 is pushed to the left and the needle 14 is raised by turning the flywheel, the kick should also be raised.

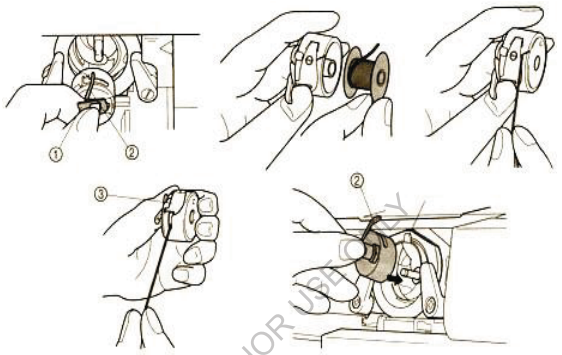

Figure 3.3. Scheme of tying the bottom thread on a sewing machine type 1022-M

When the shuttle strip is finished, to replace it with another filled tube, first stop the machine (Fig. 3.3, 3-4), remove the shuttle tube and the machine is switched to idle mode, the tube is mounted on a special device and the thread is filled from the spool to the tube. The sewing process is then continued by setting the thread-filled tube in place. This leads to a lot of time spent sewing the item and in turn a decrease in work productivity. Therefore, it is important to improve the sewing machine by filling the tube with yarn at the same time, ie during the sewing process.

Figure 3.4. The work to be done during the automatic filling of the shuttle tube

In order to overcome the above shortcomings, it continues to save time and energy spent on this work by continuing to sew it in place without removing the shuttle tube.

The extra time spent sewing in the preparation of the item also leads to a slight decrease in work productivity. At present, these indicators do not meet the technical requirements. It is advisable to do this to fill the tube without stopping the machine, but while the sewing process is in progress. For this reason, a pulley with a diameter of 20mm was installed to lift the head of the sewing machine (Fig. 3.5) to install the thread filling device on the tube 5, so as not to interfere with other details in the location closer to the shuttle device of the shuttle shaft. Attach a second pulley of the same size to the car body and attach it to the shuttle tube knocked. The rotary motion to the tube is transmitted from the shuttle shaft by a belt drive 4 from a pair of newly installed pulleys (Fig. 3.5).

Tube 5 is filled from a separate placed yarn spool 7 (Fig. 3.6). To do this, attach the thread from the spool to the spare tube and attach it to the second pulley shaft, and the sewing process can continue on the machine. When the tube is filled with yarn, press the button 6, which is attached to the tube, and a

specially mounted knife for cutting the yarn from above moves downwards and stretches the yarn. When the shuttle thread is finished, the machine is stopped for a moment, replaced with a tube filled with spare thread, and the process is repeated.

3.5-расм. Моки шпулкасини автоматик тўлдириш мосламасини ўрнатиш жараёни

Experiments have shown that in order to sew a single suit suit pants, you need to fill the shuttle thread into the tube 4-5 times. It is proposed to install an additional automatic thread filling device, which saves time when filling the thread when used.

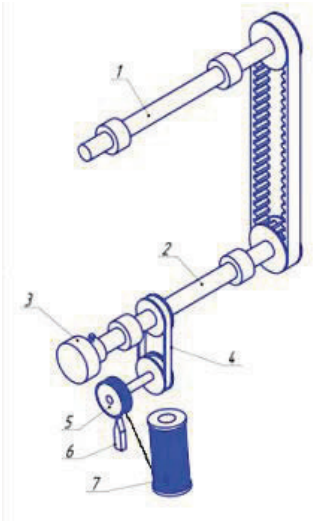

Figure 3.6. Automatic filling device of the shuttle pulley proposed scheme

1-st main shaft, 2-nd shuttle shaft, 3-rd shuttle, 4-th belt drive, 5-th shuttle spool (spool), 6-th spool sensing button, 7-th spool spool.

Considering that it takes 2-2.5 minutes to stop the machine and fill the yarn each time, it takes 13-15 minutes for the item to be fully sewn. If you save such time in each machine, you will save at least 1 hour to fill the thread when sewing 4 suits during the shift. If the time saved is spent on sewing, you will be able to sew 5 suits instead of 4 during the shift. This means that if the company sews suits on 10 of these sewing machines, it will be possible to increase productivity by 10-12% by sewing 10 suits during the shift due to the saved time.

3.3. Economic justification of the parameters of the yarn filling device for the improved tube

On the basis of theoretical and experimental tests in 3 different modes: 1st shift, 2nd shift, 3rd shift automatic spinning device was prepared on the experimental plot of Bukhara educational production enterprise.

The prepared test samples were applied to the sewing machines of the sewing production workshop. Each time a tube was finished, the time taken was determined by replacing the tube taken from the moki with a new one, that is, a tube with a full thread.

As a result of tests conducted in the sewing industry, it was found that the operating life of the automatic spinning machine is 2460 hours (Figure 3.7). When the yarn filling device is applied, the average operation time of the yarn filling is increased from 9000 hours to 10200 hours in 3-shift operation mode, ie by 12%, and the machine productivity reaches n = 1220 bahya / min without additional costs.

Economic efficiency was calculated on the basis of the methodological manual approved by the Department of Science and Technology under the Cabinet of Ministers of Uzbekistan [25]. 14.02.2010 N: 48151356.

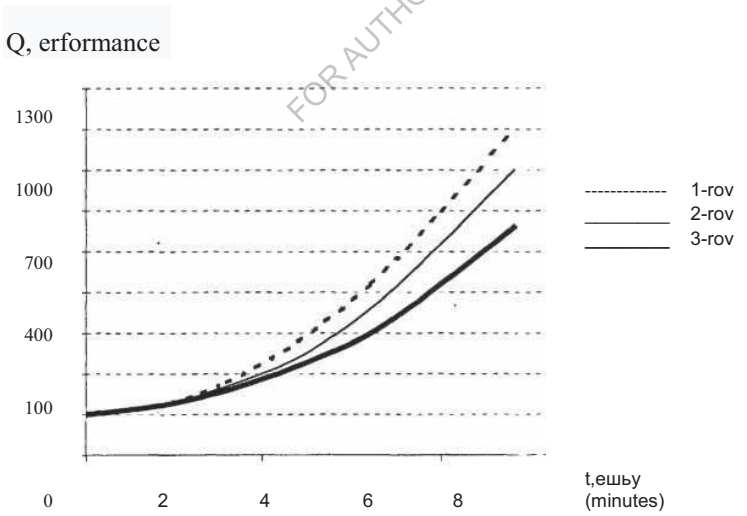

Figure 3.7. Graph characterizing the increase in productivity on the machine due to the saved time

The annual economic efficiency was based on a comparison of baseline and new techniques.

basic equipment $T_б$= 172/4780 = 0,0359

new equipment $T_я$ = 2460/4780 = 0,514

We define the renovation coefficients inversely to the service life in a simplified way.

$P_б$ = 1/0,0359=27.86 $P_я$ =1/0,514= 1,94

Assuming that the operating costs, i.e. the base and new machines, are conditionally the same, the efficiency expected to increase the service life is determined by the following formula.

$$Э_{1=}(Ц_б \frac{P_Б + E_Н}{P_Н + E_Н} - Ц_Н) A_Н = (49 \cdot \frac{27.86 + 015}{1.94 + 0.15} - 49) \cdot 144 = 2237151 \text{ ,7 сўм}$$

In addition, the new yarn filling device increases the productivity of the sewing machine. Current cost per 1 sewing machine in the basic option:

$$Ц_б = U \frac{O_Н}{O_б} = 20460 \cdot \frac{15110.5}{13509.5} = 22884 \text{ сўм}$$

We determine the amount of efficiency that comes from machine productivity by the following formula:

$$Э_2 = \left[C_б \cdot \frac{O_Н}{O_б} \cdot \frac{P_б + E_Н}{P_Н + E_Н} + \frac{(U_б - U) - E_Н(K_б - K_Н)}{P_Н + E_Н} - C_Н \right] \cdot B =$$

$$= \left[4100 \cdot \frac{15110.5}{13509.5} \cdot \frac{27.86 + 0.15}{1.94 + 0.15} + \frac{22884 - 20460}{1.94 + 0.15} - 4100 \right] \cdot 40 = 238848.36 \text{ sum}$$

Expected annual cost-effectiveness when an improved yarn filling device is implemented

$Э = Э_1 + Э_2 =$ 2237151,7+ 238848,36 = 2476000 makes up the sum

This means that if the company sews suits on 10 of these sewing machines, it is possible to increase productivity by 10-12% during the shift due to the saved time.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

It is known that more than 130 sewing machines and machine-building enterprises around the world are currently developing various specialized machines and aggregate systems, devices, as well as the optimal options of working bodies and details of their improved designs. Especially on high-speed sewing machines, automatic thread filling into the tube without stopping the machine includes functions such as saving time and preventing wastage of electricity.

Based on the experimental studies, the need for the installation of an automatic yarn filling device was identified:

1. The machine has a special device design to prevent the time spent on sewing, thread filling and excessive electricity consumption for thread filling.

2. It was found that when filling the shuttle tube to the thread, the machine is stopped and after the thread is filled, it takes 2-2.5 minutes for the sequence of work to be carried out, and by saving this time, the work productivity increases by 1.5 times.

Only 49,000 soums were spent on the recommended device for filling the shuttle tube with yarn. That is, the following expenses were incurred:

- pulleys with two diameters d = 20 mm - 8000 soums,
- a metal bullet with a diameter of d = 4 mm and L = 30 mm to fasten the second pulley to the car body - 500 soums,
- Strip extension for pulleys - 4800 soums,
- Thread cutter filled with tube yarn - 3700 soums,
- button to cut the thread when the tube is full of thread - 12000 soums,
- Master fee for installation of the device in the car - 20,000 soums.

The cost-effectiveness of saving time by automatically filling the tube without stopping the sewing machine and preventing wastage of electricity - increases productivity by 10-12% during the shift, the annual profit of the sewing shop is 2,476,000 soums.

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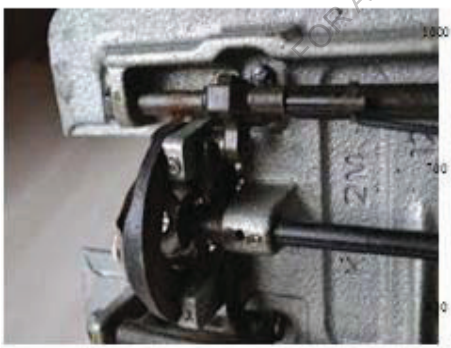
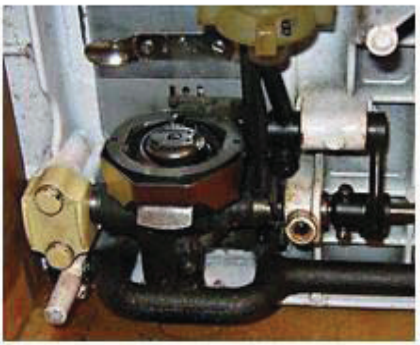
applications

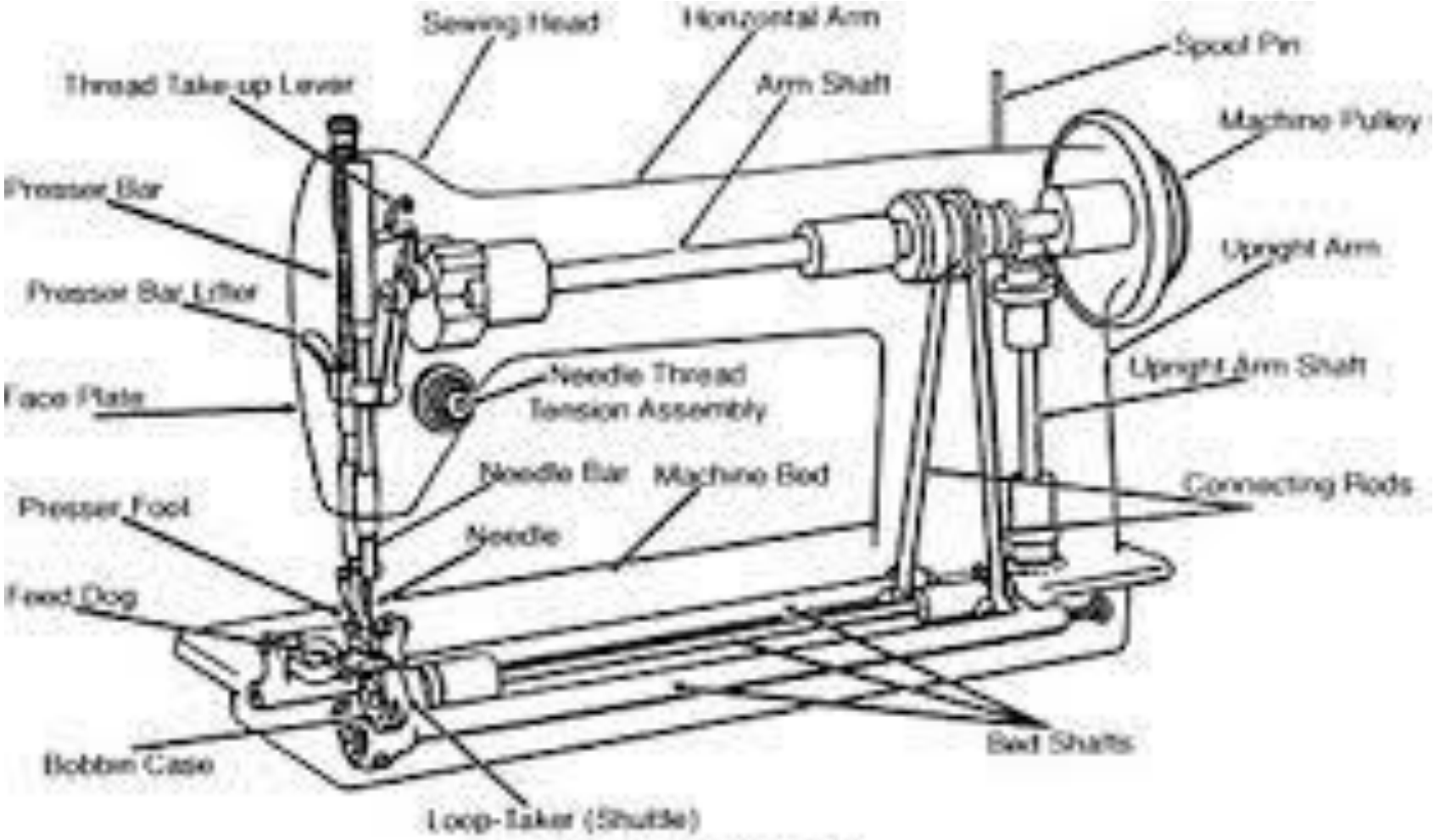



Plates from the installation process of the automatic thread filling device to the shuttle tube

Work performed by automatic replenishment of the shuttle bobbin





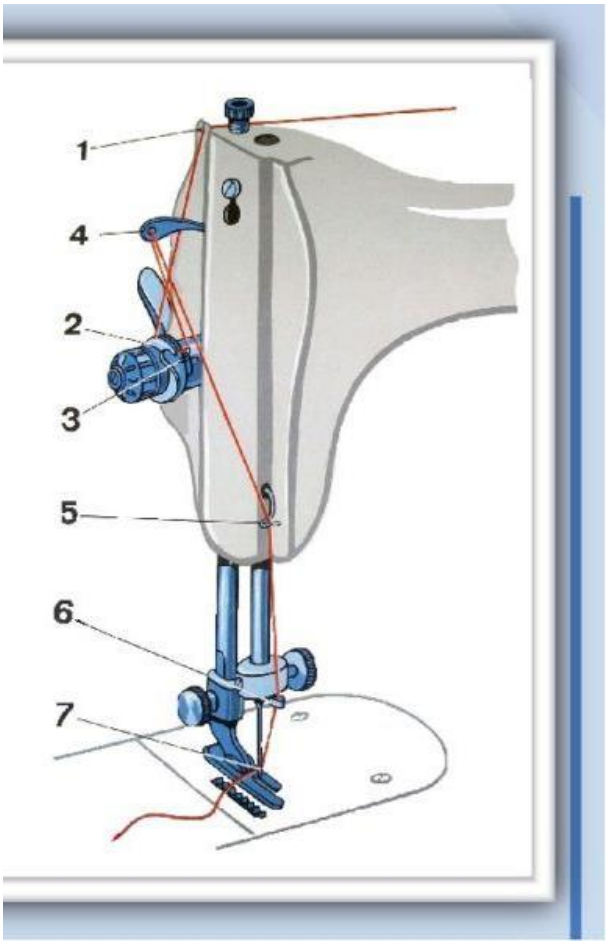


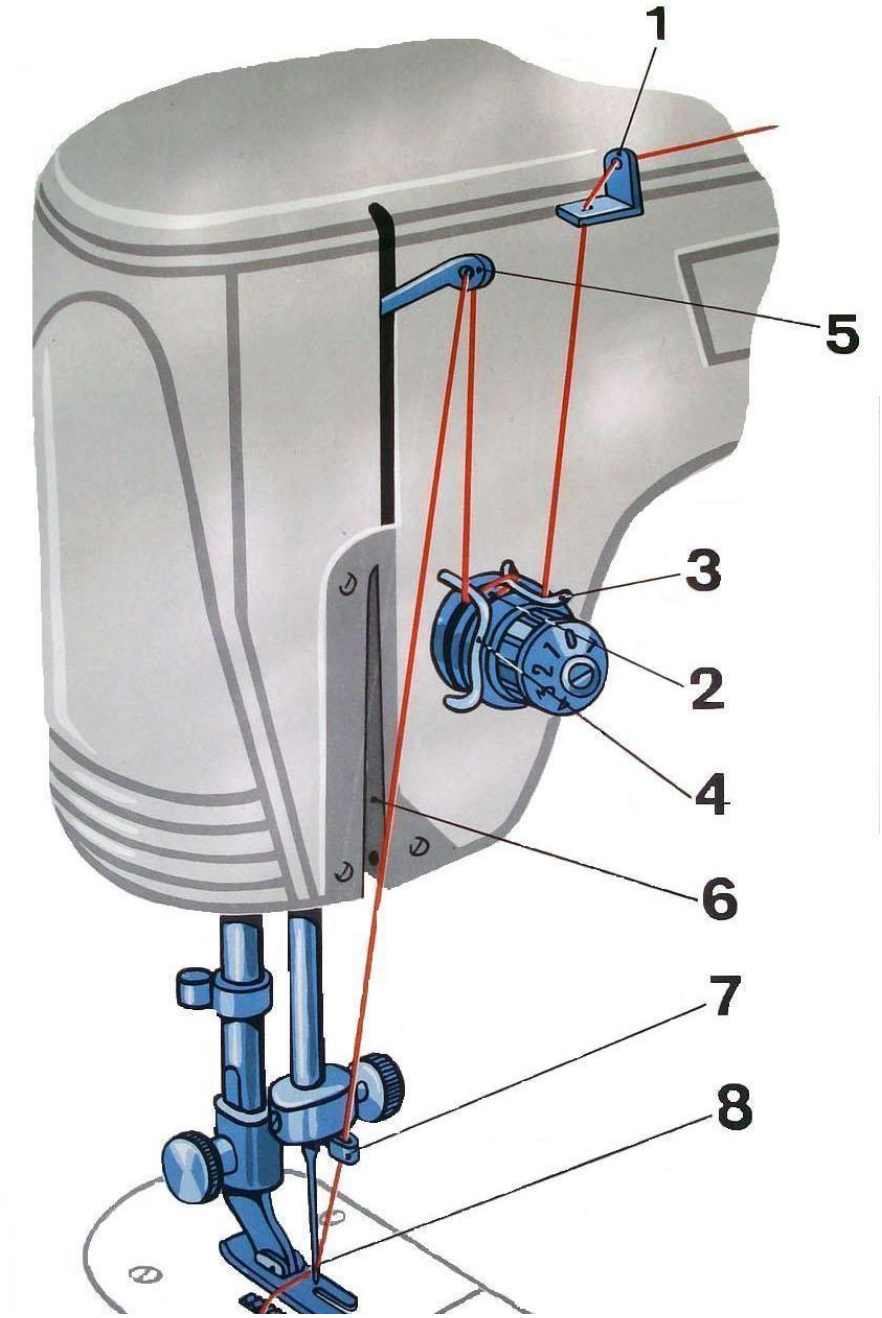
HEAD (Front View)

Sewing machine

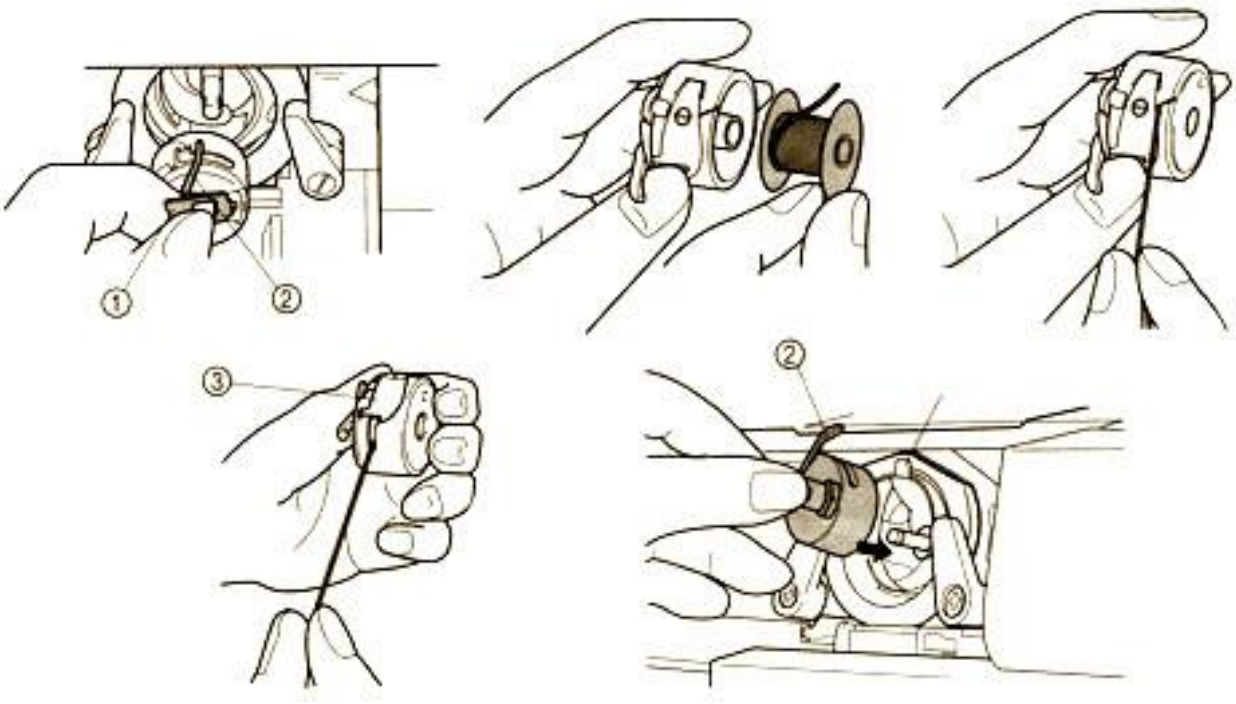
Thread the upper thread

1- thread guide
2- Upper thread tension dial
3- compensation spring
4- thread take-up
5- thread guide
6- thread guide roll
7- needle

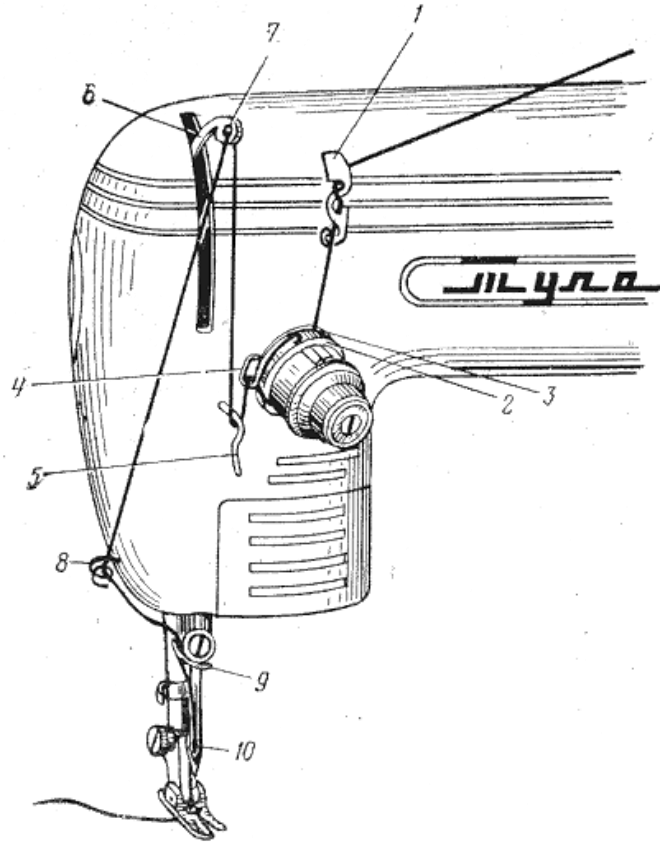




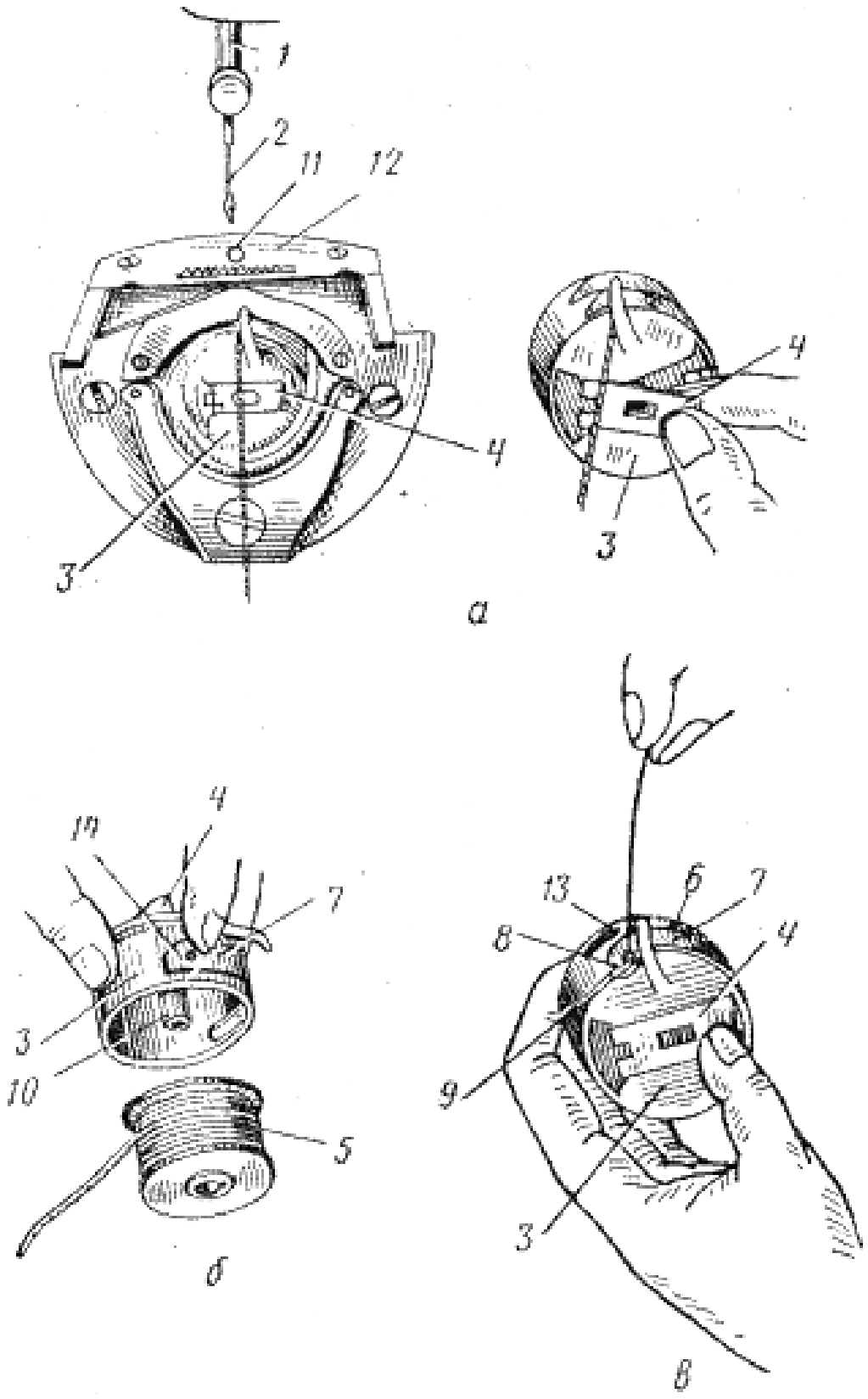
Threading the upper and lower threads



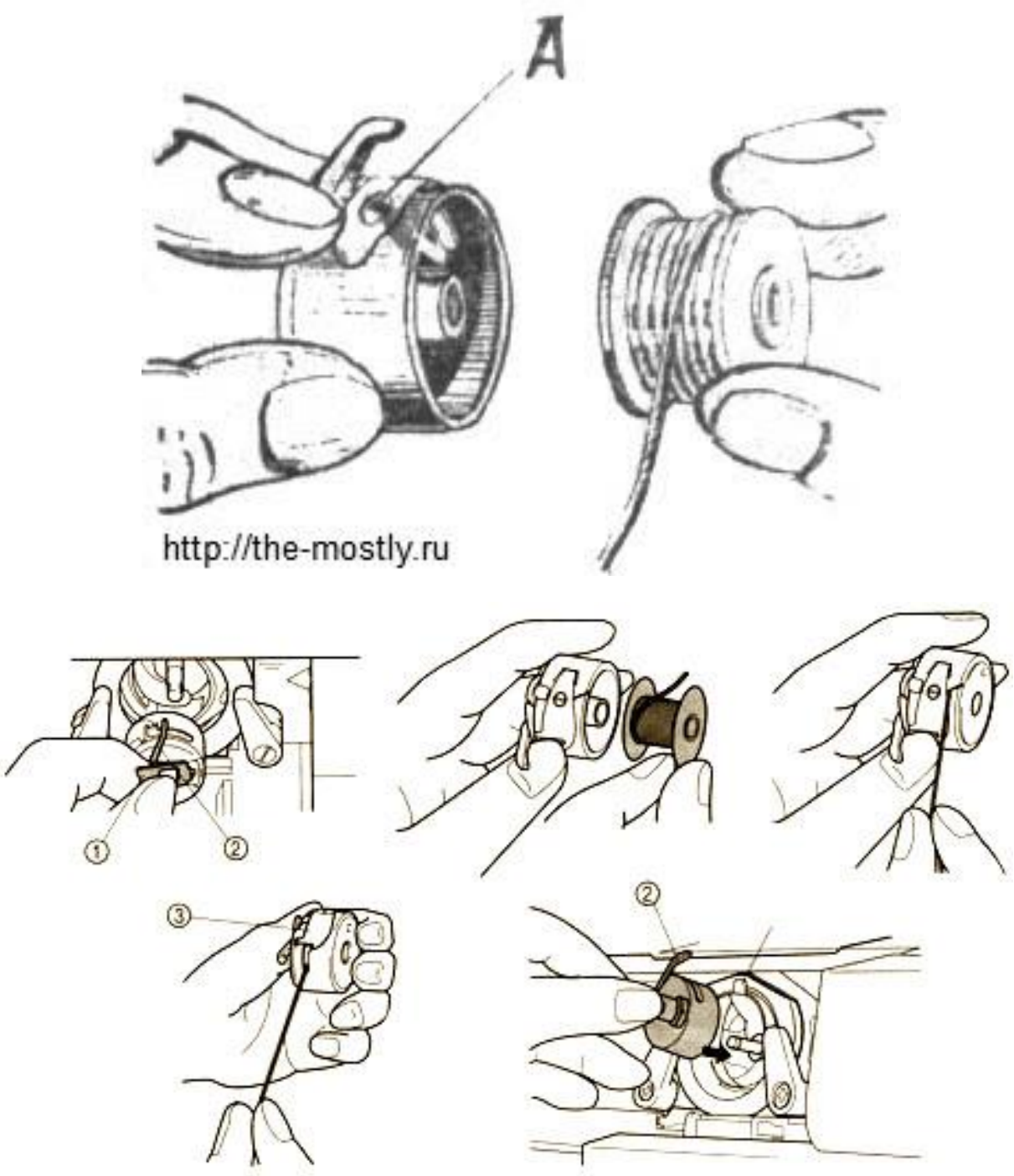
How to thread the upper and lower thread into the sewing machine



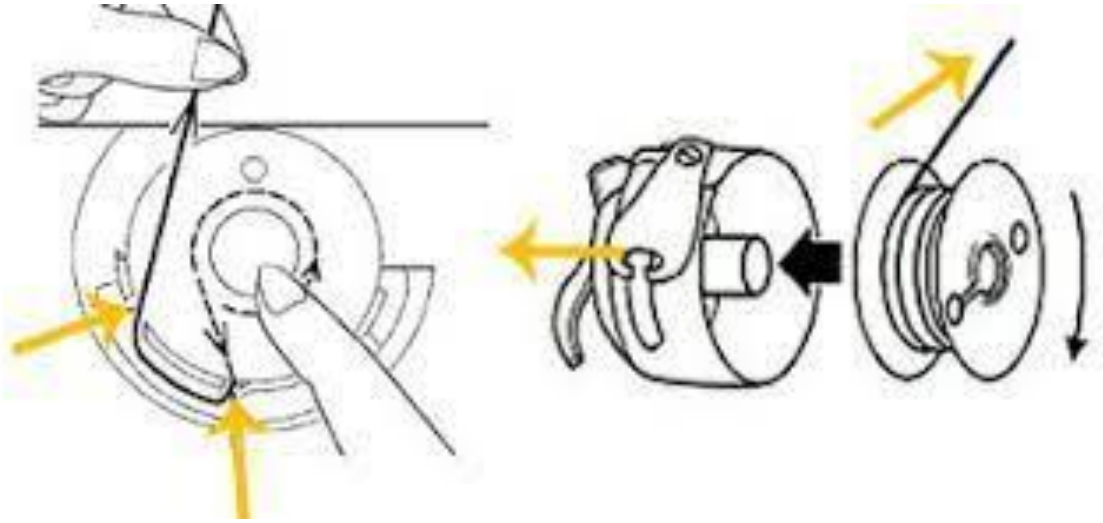
Threading the upper thread and adjusting its tension



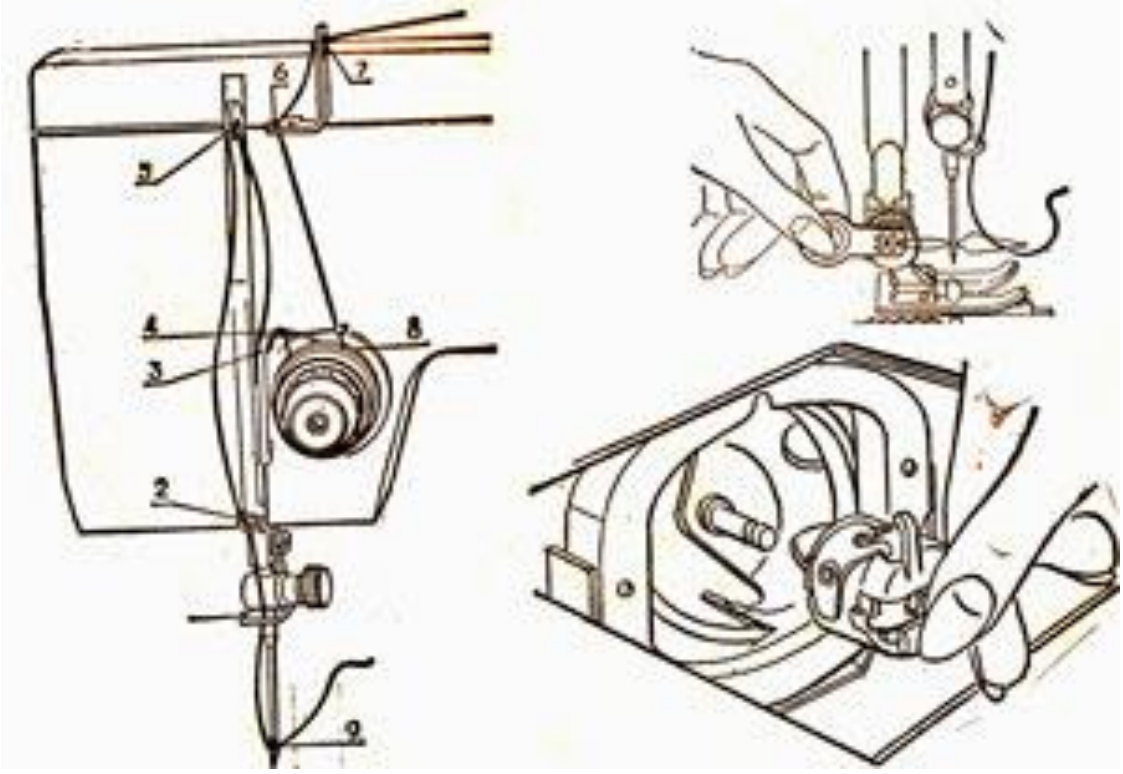
Threading and adjusting the bobbin thread in the sewing machine



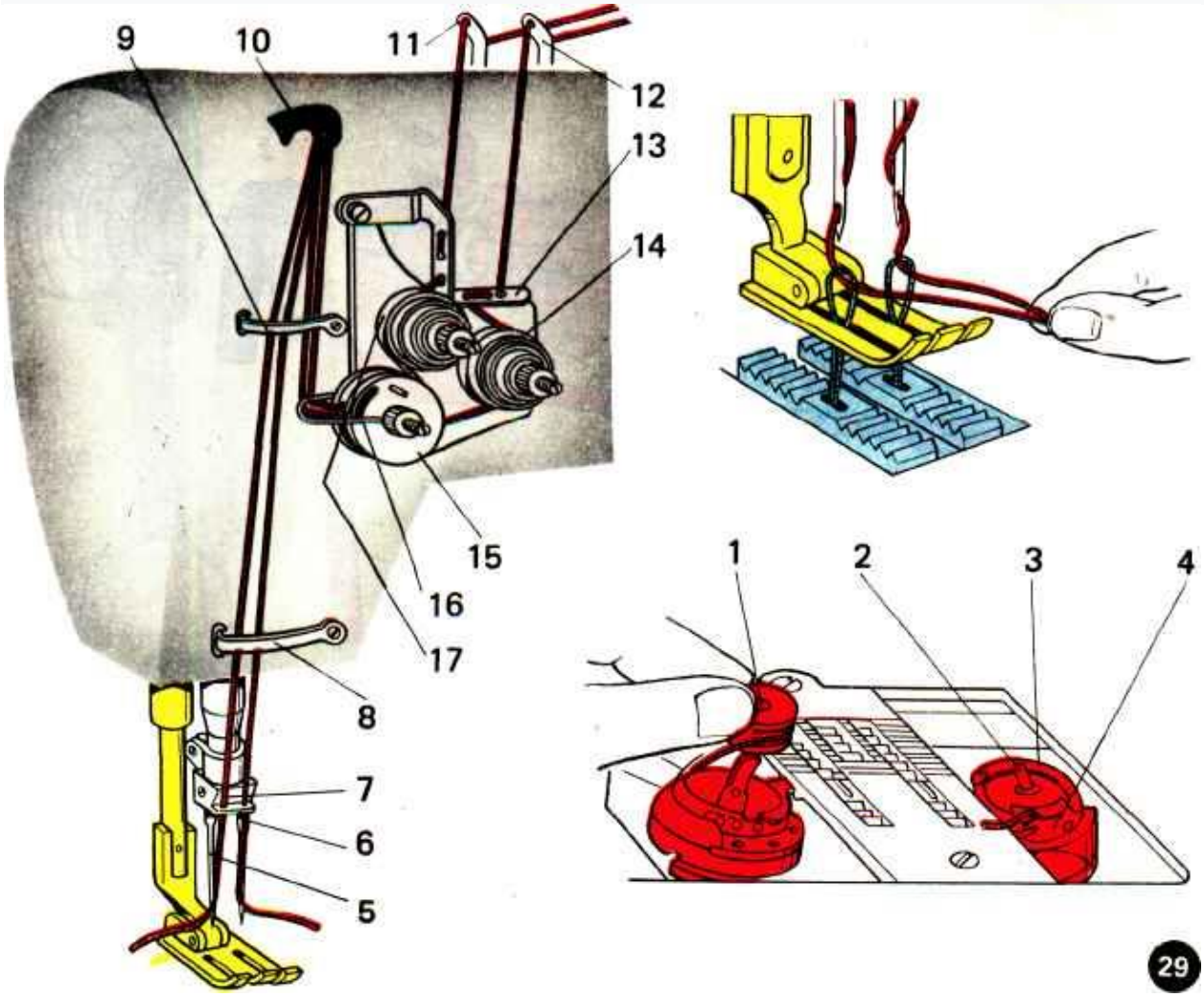
How to correctly insert thread into a sewing machine



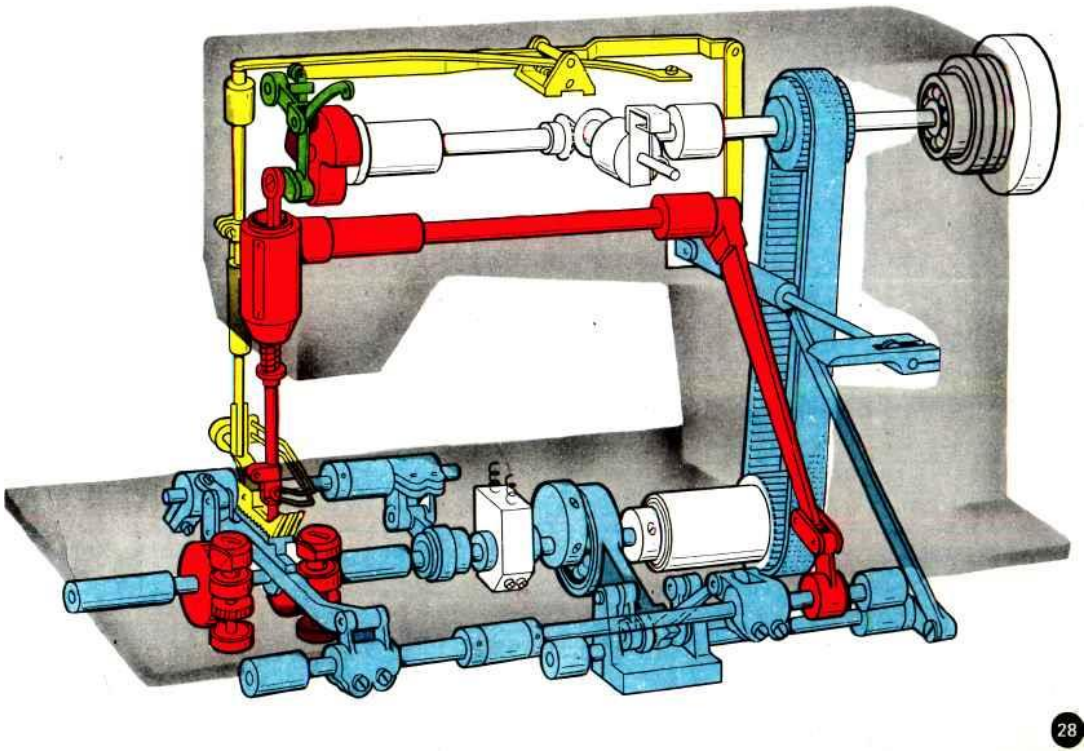
How to properly thread a bobbin into a sewing machine



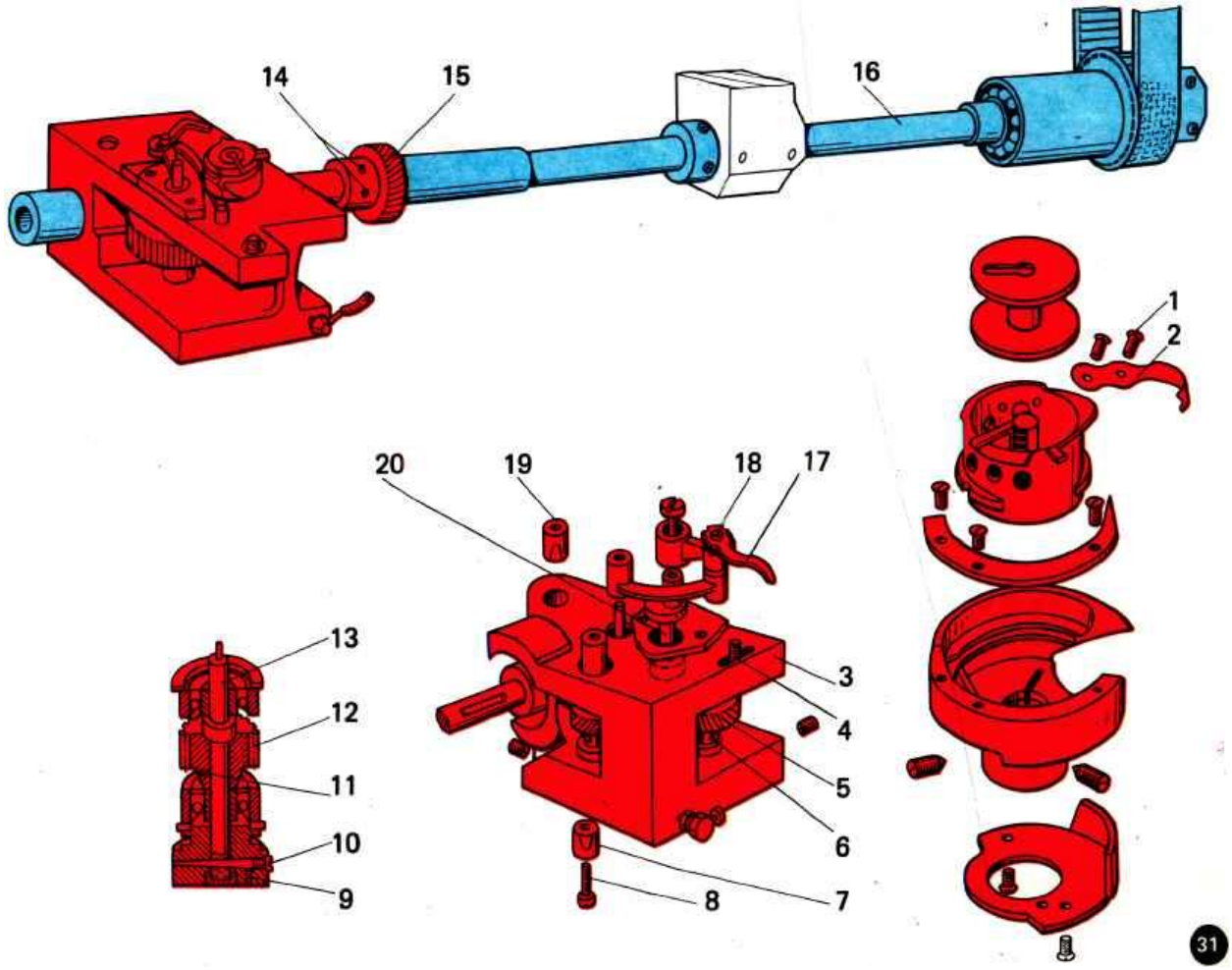
Sewing machine Chaika, Podolsk-142

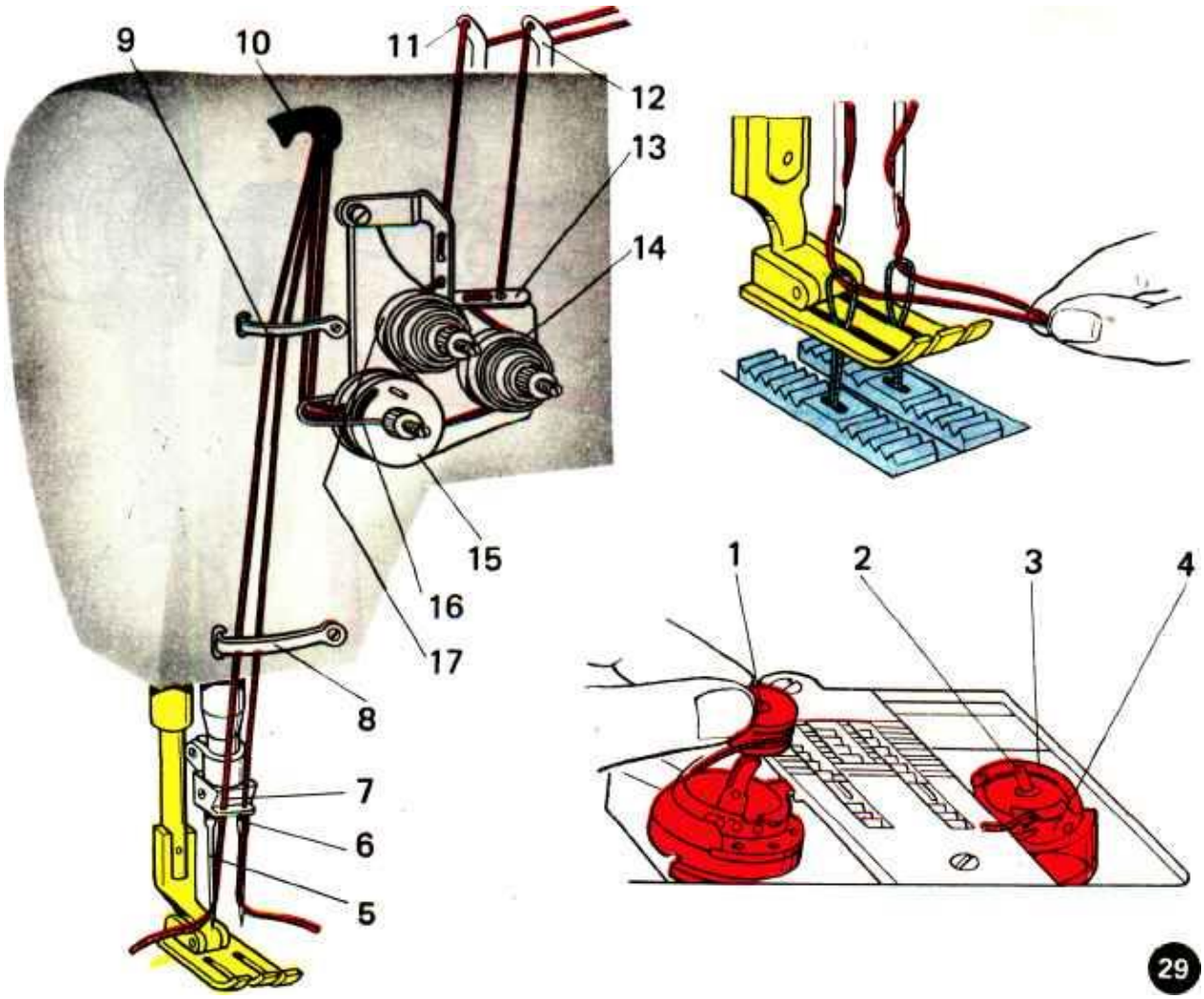


862 Grade Industrial Sewing Machine

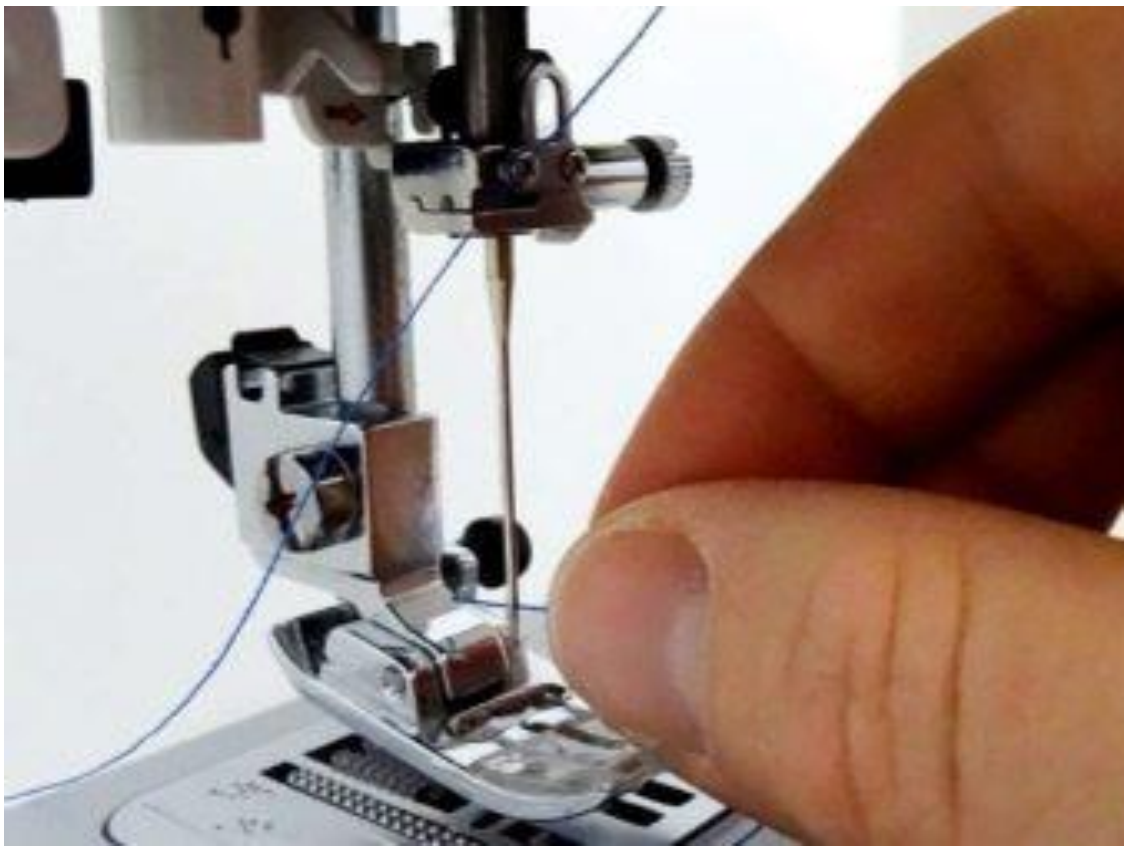


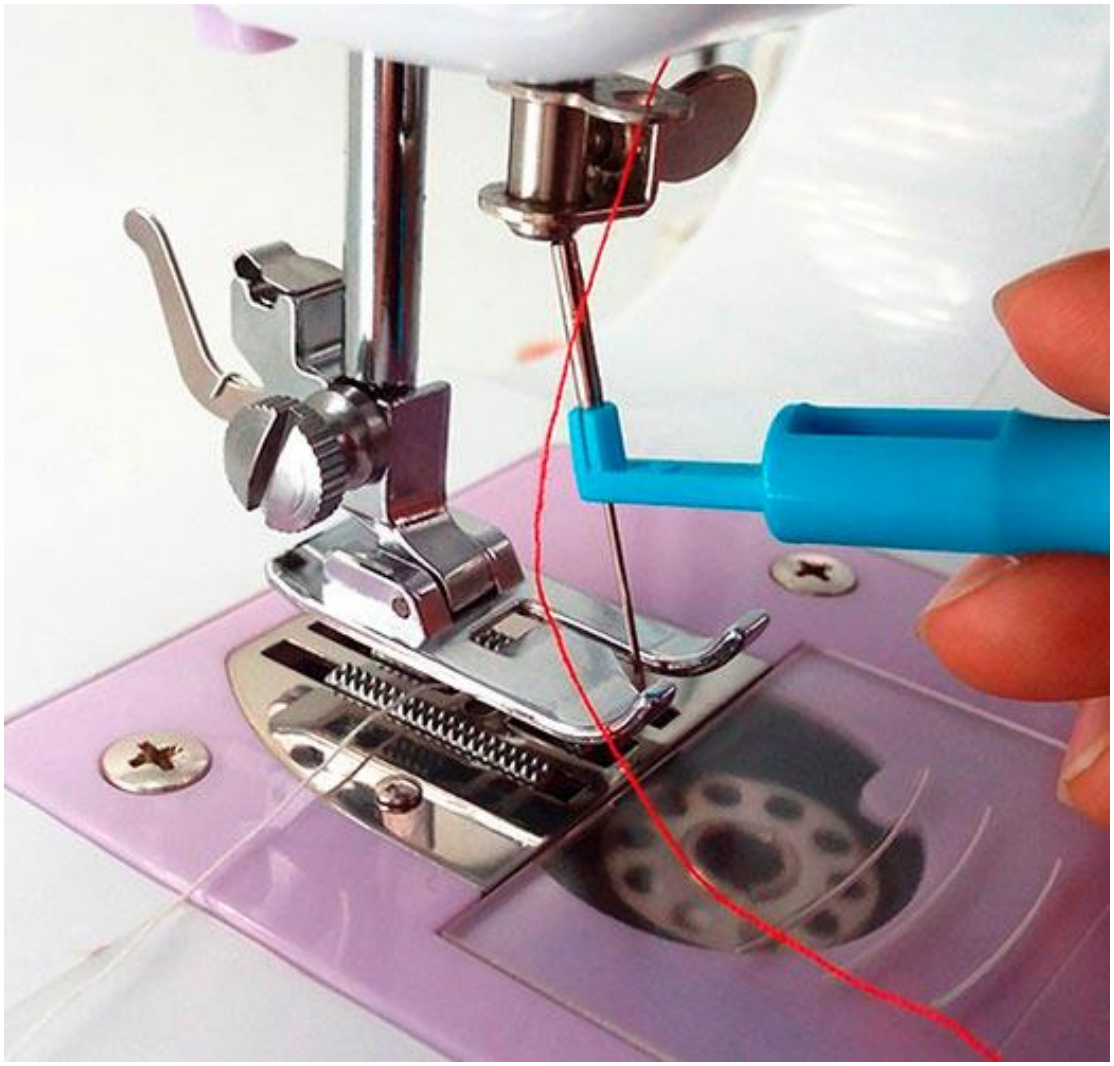
862 Grade Industrial Sewing Machine

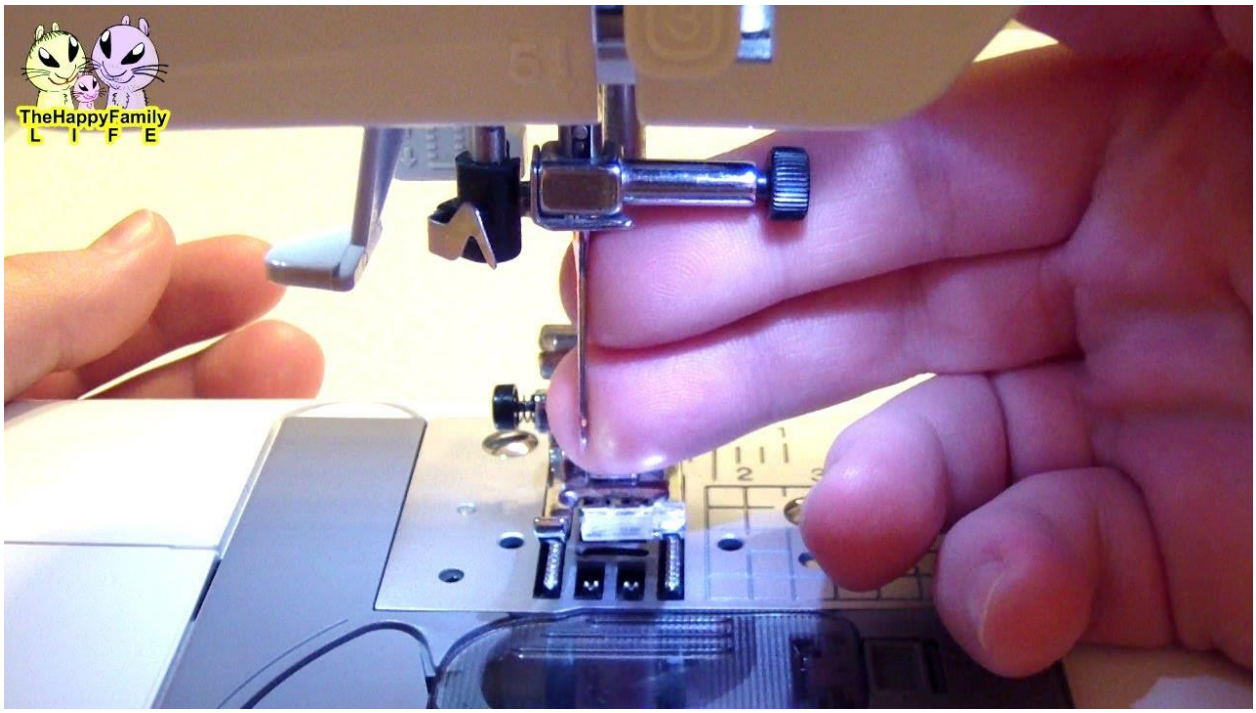




862 Grade Industrial Sewing Machine

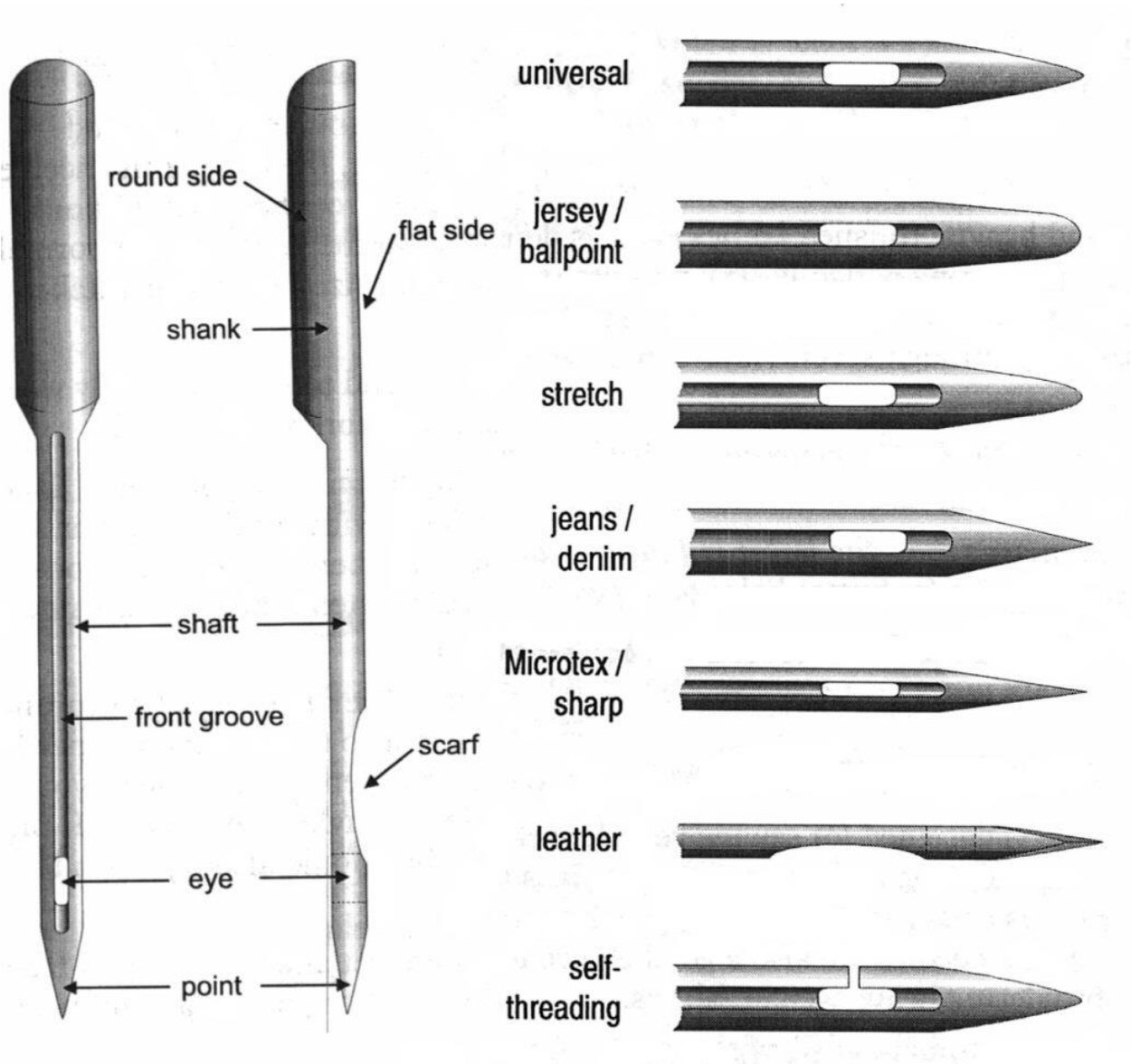





TheHappyFamily
L I F E

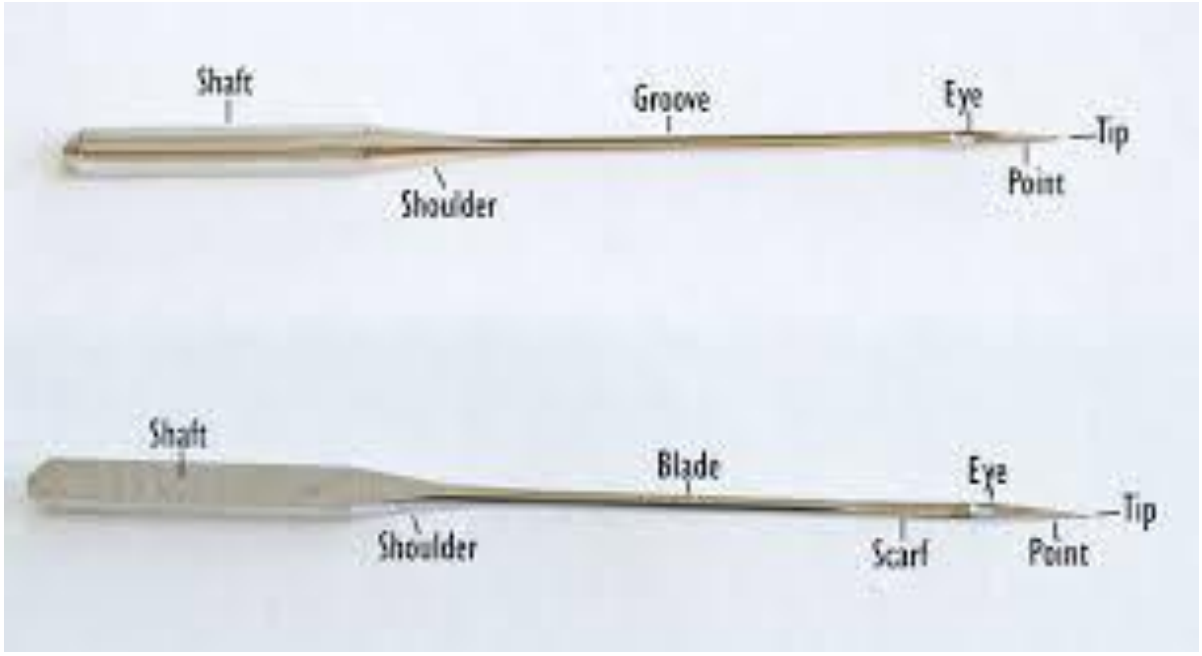
Which side to insert the needle into the sewing machine

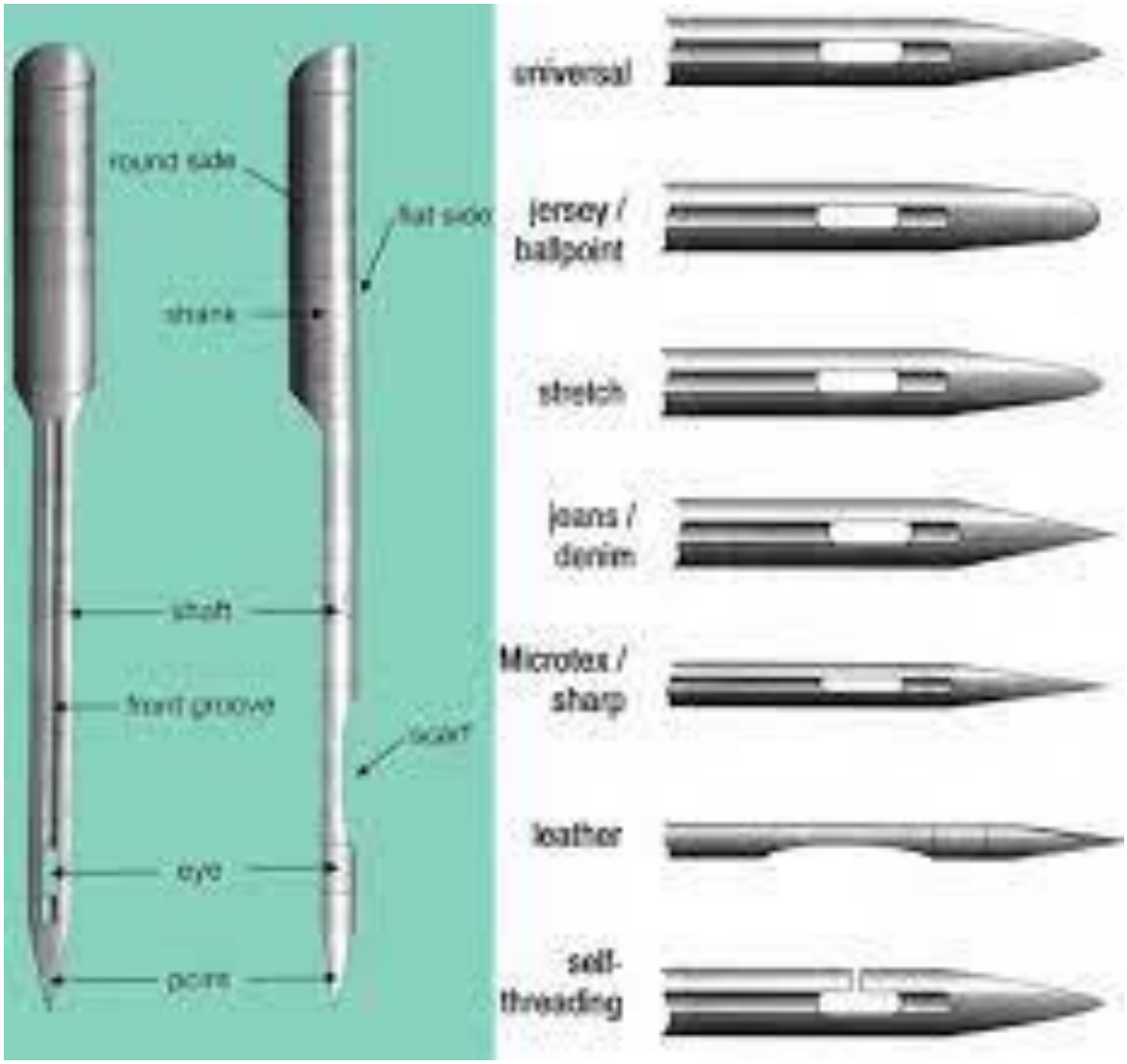
Types of sewing machine feet



Needle sewing machine


Universal
Embroidery
Jersey/Ballpoint
Jeans/Denim
Leather
Metafil/Metallic
Quilting
Microtex/Sharps
Stretch
Topstitching
Self-threading
Wing
Twin
Twin-Wing
Triple
Spring
Types of sewing machine needles


Shaft
Groove
Eye
Tip
Point
Shoulder
Shaft
Blade
Eye
Tip
Shoulder
Scarf
Point


round side
flat side
shank
shaft
front groove
back
eye
point
universal
jersey / ballpoint
stretch
jeans / denim
Microtex / sharp
leather
self-threading

Sewing machine lubrication

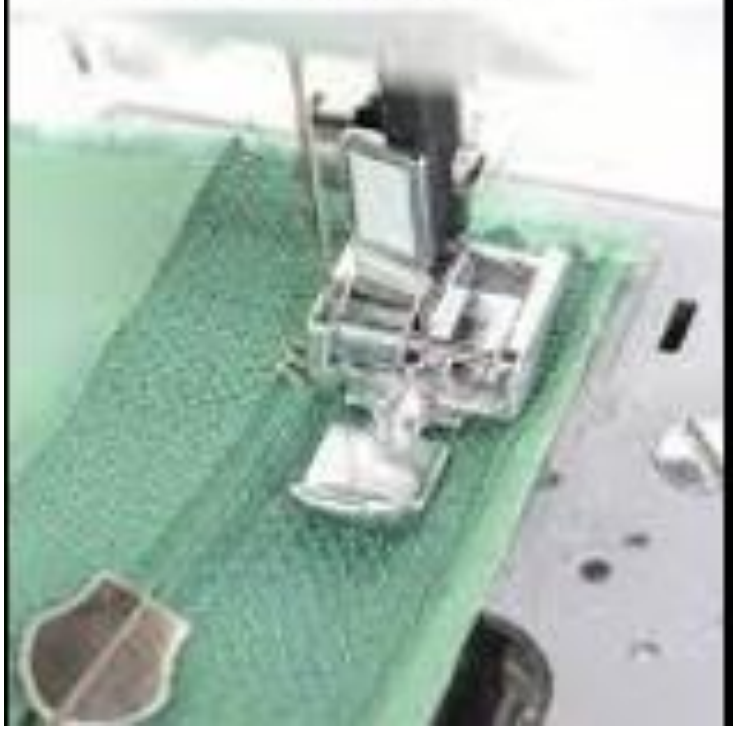

Sewing
Machine
Maintenance
How to Oil and Clean
Video Tutorial
(Top Loading Bobbin
Sewing Machines)


CLEAN
YOUR
SEWING
MACHINE
HOW TO

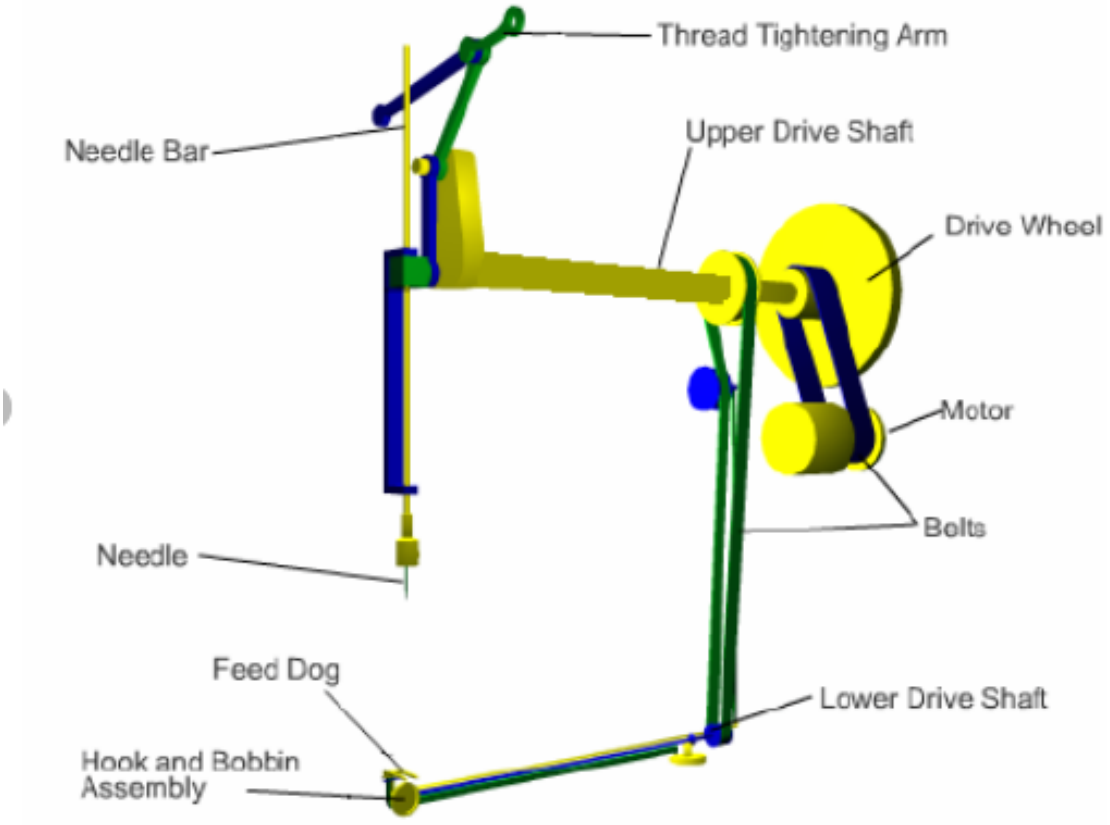
How to clean a sewing machine

An essential guide

www.thecraftygentleman.net



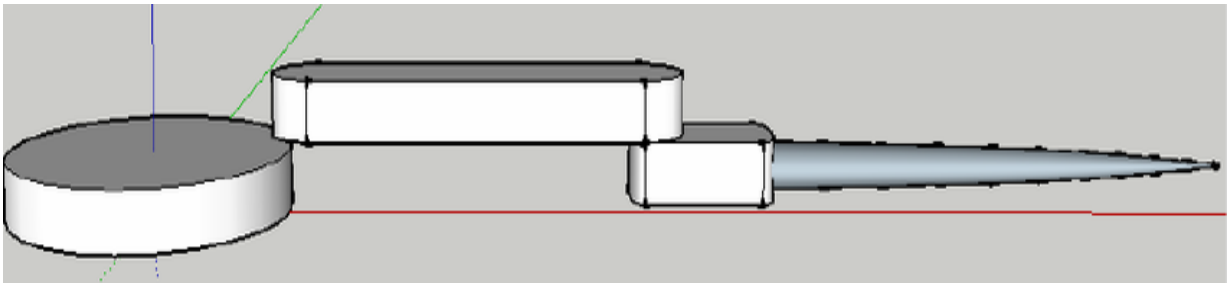
Adjustment of sewing machine mechanisms



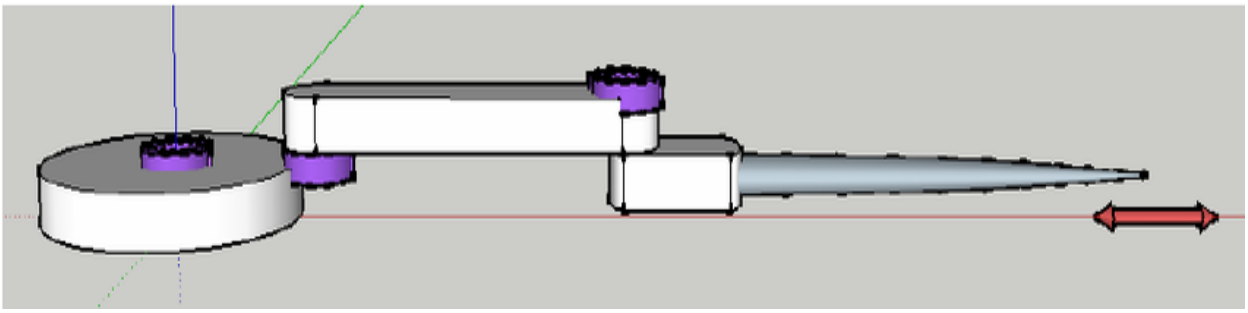
Sewing machine construction

How to Easily Adjust Sewing Machine Tension

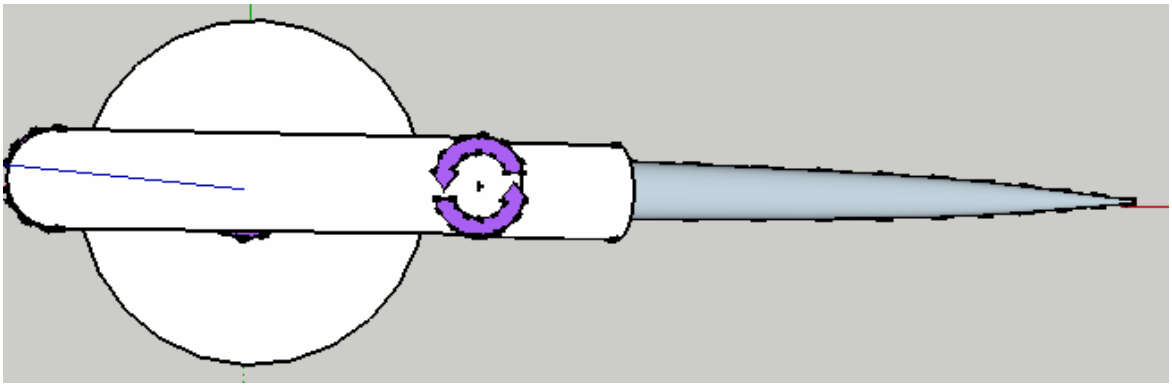
A sewing machine is textile equipment used to assemble different types of materials together using stitches. One of the most important components of a sewing machine is represented by the sewing needle that fits into the needle bar. In order to ensure the movement of the needle bar, a connecting rod crank mechanism is used to transmit force and mot.



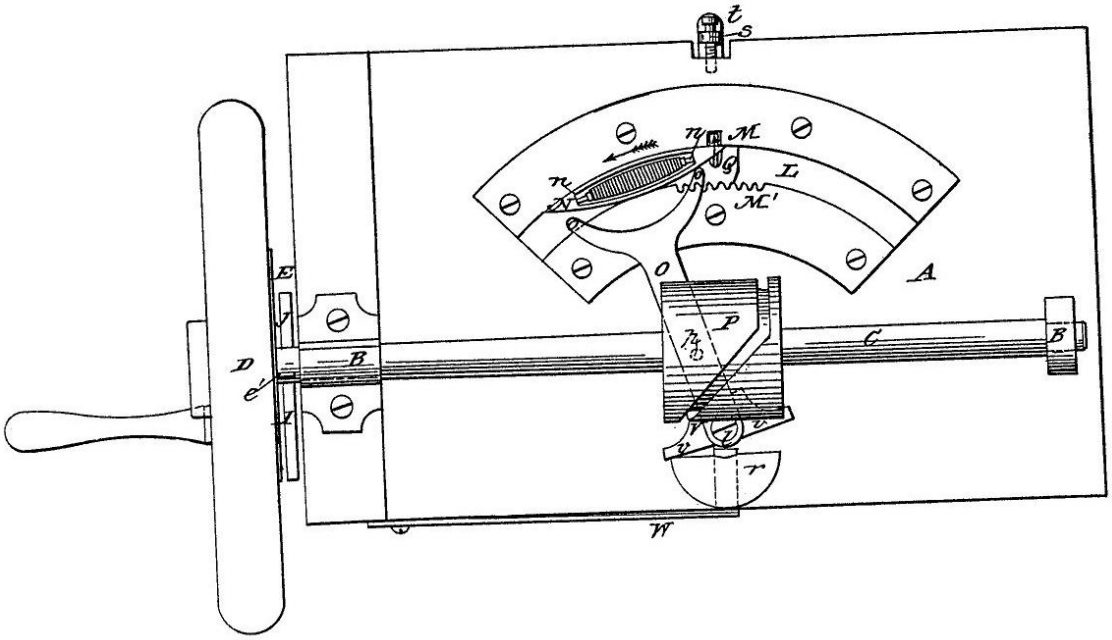
Construction of rod-crank mechanism



Connecting the compounding elements of the rod-crank mechanism



Positions of the rod-crank mechanism during animation The students discuss and comment on the specific movements of the mechanism. The displacement of each component is commented and characterized. The students select the type of



Vibrating Shuttle sewing machines history-Fiddlebase