

CHAIN TYPE HAND STITCH IMITATION MACHINES FOR MEN SUIT MANUFACTURING

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Professional paper

UDC: 687.1: 62-1: 646.4

DOI: 10.5937/tekstind2203052N



Abstarct: *Machines of chainstitches 104 create imitation of hand stitches 209 from one material side. Every hand stitch is formed from two threads, therefore the seams are more accented and very short length pick stitches are larger than created seams from real hand stitches 209. The length of the hand stitches is determined by the distance between a sewing needle and a hook needle of the machine. To create different length hand stitches a gauge set of the machine has to be changed. Because of different appearance of the stitches on top and bottom fabric surfaces the machines are used for top stitching of seams which are seen on a ready garment from one side only. In men suit manufacturing there are: top stitching of a jacket's lining, top stitching on pockets, fronts, etc. of jackets, vests, trousers. There are also available chainstitch 104 machines which create different variations of the hand stitches: double row hand stitches, parallel hand stitches, angular hand stitches. Comparing with the machines of real hand stitches 209, the machines of chainstitches 104 are much lower priced and have much higher productivity.*

Keywords: men suit manufacturing, hand stitches, saddle stitch machines, pin-point saddle stitch machines, hand stitch imitation machines.

ŠIVAĆE MAŠINE RUČNIH LANČANIH UBODA ZA IZRADU MUŠKI ODELA

Apstrakt: *Mašine lančanih uboda 104 prave imitaciju ručnih uboda 209 sa jedne strane materijala. Svaki ručni ubod je formiran od dva konca, zbog toga šavovi su više vidljivi i tačkasti ubodi su veći nego u šavovima pravih ručnih uboda 209. Dužinu ručnih uboda određuje razmak između šivaćom iglom i kukastom iglom. Promenu dužine uboda se postiže pormenom kompleta fiksiranja igala (gauge set). Zbog različitog izgleda uboda na gornje i donje strane materijala, mašine mogu da budu korištene samo za izradu šavova koji se vidi na gotovom odevnom predmetu samo sa jedne strane. U izradi muških odela mašine se koriste za: dekorativno prošivenje podstave, đepova, prednjih delova sakoa, prsluka, pantalona. Dostupne su i mašine koje prave druge varijante imitacije ručnih uboda, kao su: ručni ubodi u dva reda, paralelni ručni ubodi, kosi ručni ubodi. U poređaju sa mašinama pravih ručnih uboda 209, mašine lančanih uboda 104 su mnogo jeftinije i obezbeđuju mnogo veću produktivnost.*

Ključne reči: izrada muškog odela, ručni ubodi, mašine uboda sedla, mašine tačkastih i uboda sedla, mašine imitacije ručnih uboda.

1. INTRODUCTION

Real hand stitch sewing machines create hand stitches 209. Their seams are perfect for top stitching colors, lapels, pocket flaps manufacturing men suits. However, these machines have several serious disadvantages: they ensure low productivity (sewing speed is only up to 500r.p.m.), mostly they work with limited length thread (cannot be used thread from a cone, it has to be cut in separate pieces up to 120cm long) and there are very expensive [1]. To avoid these problems, for some applications the industry can use other kind of chainstitch machines.

These machines create stitches 104 - stitches which look similar to hand stitches 209 from one material side. In professional literature they use to be named very differently: *saddle stitch machines*, *pin-point saddle stitch machines*, *pin to pin chainstitch machines*, *hand stitch imitation machines*, *fake hand stitch machines*, or *chain type hand stitch machines*. Comparing with the real hand stitch machines, the

chainstitch machines are much lower priced and have much higher productivity, their sewing speeds are 1000-2500 rpm [1].

The machines of hand stitches in chainstitch variation are manufactured by companies: *Japsew*, *Juki*, *Sakura Stitch*, *Highlead*, *Jack*, *Consew*, *Zoja*, *Alpha*, *Sera*, others.

2. CONSTRUCTION AND APPEARANCE OF STITCHES

Because of the specific construction of the stitch 104 (see Fig.2,a), straight stitches, visually similar to hand stitches, are seen on the bottom fabric surface (see Fig.2b), [2]. However, every stitch (on the bottom fabric surface) is formed from two threads (see Fig.2a), therefore the seams of these stitches are more accented/visible and very short length pick stitches are larger than created seams from real hand stitches 209. As stitch 104 is chainstitch, loops are formed on the top fabric surface (see Fig.2c).



Figure 1: Pin point saddle stitch machine Highlead GK0088

Slika 1: Mašina tačkastih i uboda sedla Highlead GK0088

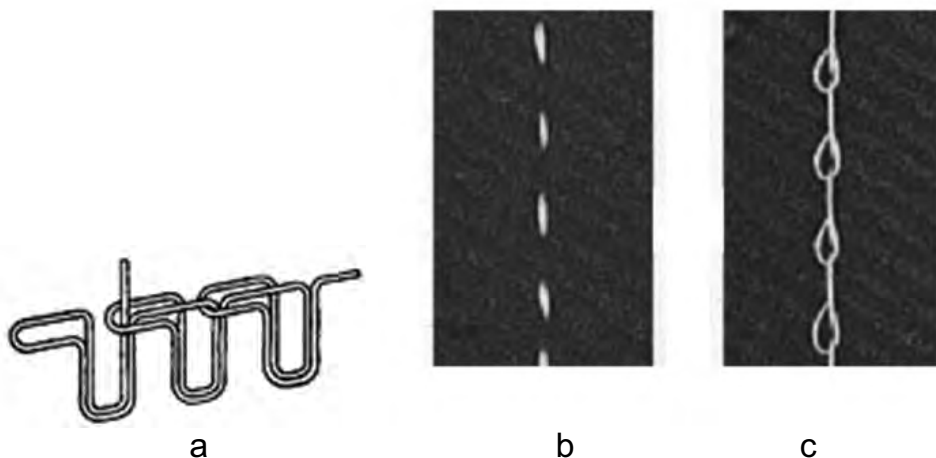


Figure 2: Chainstitches 104 (a), on the bottom fabric surface (b) and on the top fabric surface (c)

Slika 2: Lančani ubodi 104 (a), na donje strane materijala (b) i na gornje strane materijala (c)



Figure 3: Hand stitches on the lining of a men jacket
Slika 3: Ručni ubodi na podstave muškog saka

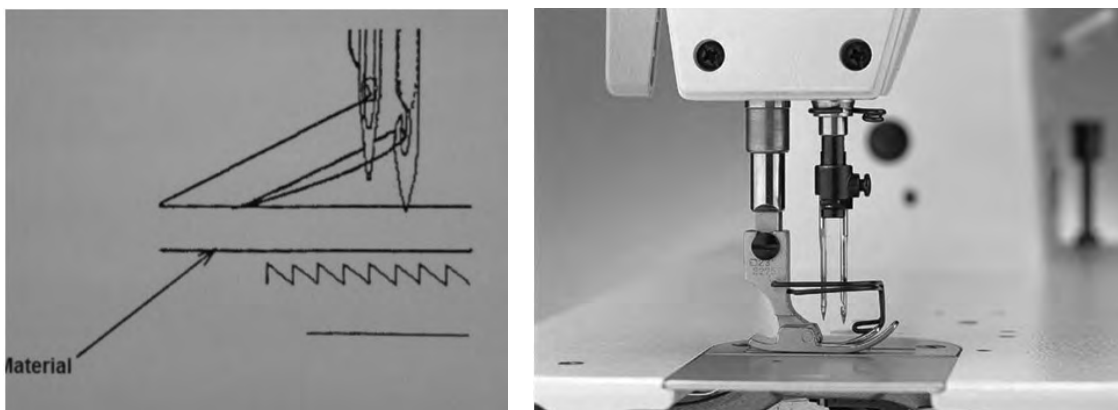


Figure 4: Sewing needle and a hook needle
Slika 4: Šivaća igla i kukasta igla

3. APPLICATION OF THE MACHINES

The different appearance of the stitches on top and bottom fabric surfaces (see Fig.2 b,c) and also bigger portion of thread (two threads) creating the hand stitches limit their application. The machines can be used for seams which are seen on a ready garment from one side only. In men suit manufacturing there are: top stitching of a jacket's lining (see Fig.4), top stitching on pockets, fronts, etc. of jackets, vests, trousers.

The machines of chainstitches 104 use bottom feeding system [3], can be equipped with a clutch or a servo motor [4]. If servo motor is used, the machine can have automatic thread trimmer and needle positioning [5]. Lubrication is mostly manual. The seams use to be secured at the beginning and end with zig-zag stitches (New-tech), back-tacking stitches (Global, Complett) or reverse-feed stitches (Juki, Worldmac).

4. STITCH PARAMETERS

The stitches are formed by help of a *sewing needle* (also called *parent* or *straight needle*), a *hook needle*

(*crochet needle*) and *two loopers* (a large/hooking looper and a small/feeding looper/spreader), (see Fig.4) [6,7].

Using this kind of machines the hand stitch length is limited and depends on a fixed distance between the sewing needle and the hook needle.

4.1. Length of the hand stitches on the bottom fabric surface

The **length of the hand stitches** on the bottom fabric surface is determined by the distance between two needles - in professional literature called a *needle gauge* [6,7]. The machines use to have different distance between the needles, and with it, can create different length hand stitches. For example, 1.2mm, 1.6mm, 1.8mm, 2.5mm, 3mm, 4mm, 5mm, 6mm, 7mm. Imitation of pick stitches can be got with the smallest *needle gauges*.

The needle gauge (distance between two needles) determines also the length of loops seen on the top fabric surface (see fig.5).

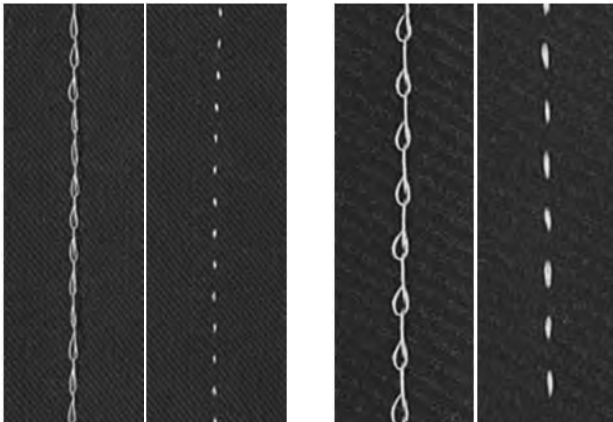


Figure 5: Seams formed with different needle gauges

Slika 5: Šavovi formirani sa različitim razmakom između igala

As the distance between two needles is fixed there is no possibility to change the hand stitch length during sewing process. To create different length hand stitches, one model of the machine can be sold with more than one **gauge set** - a needle plate, a needle clamp, a feed dog, a looper and a spreader (to get different distance between the needles).

4.2. The length of chainstitches on the top fabric surface

The portion of the material that is fed to create one stitch 104 is called a *feed/stitch pitch* (see Fig.6), [6]. It determines:

- chainstitch length created on the top fabric surface;
- spacing in between hand stitches seen on the bottom fabric surface.

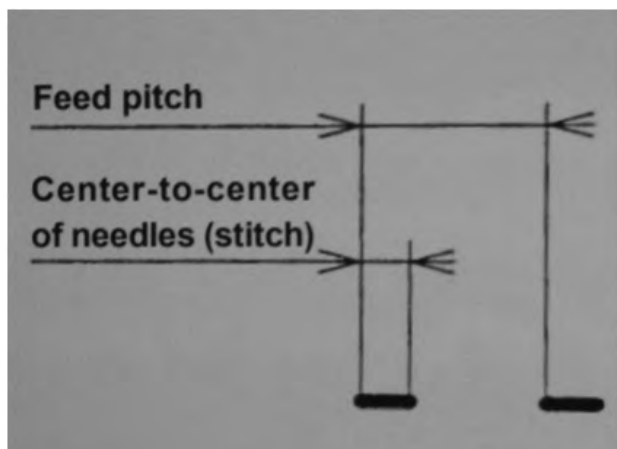


Figure 6: Feed pitch

Slika 6: Razmak između ručnih uboda

The larger stitch on the top surface, larger space between hand stitches on the bottom surface while the hand stitch length on the bottom surface stays constant (as it depends on distance between two needle only). The machines have a *feed/stitch pitch regulator* by which an operator can change the spacing between hand stitches (length of the chainstitches) freely during the work process. Standard chainstitch length is 3.5-10mm.

5. OTHER CHAIN TYPE HAND STITCH IMITATION MACHINES

There are also available chainstitch 104 machines which create different variations of the hand stitches for decorative top stitching of different other kind of garments and home textiles [8].

5.1. Machines of double row hand stitches

The machine has 4 needles (two sewing needles and two hooked needles) to stitch two parallel seams of chainstitches 104 (see Fig.7). Distance between parallel seams - 3 or 4mm, hand stitch length (distance between needles) - 2 or 3mm, space between hand stitches - 2 or 3mm. Sewing speed 1000 spm.

Double hand stitch machines are manufactured by companies: *Japsew (J-400)*, *Aurora (J-400)*.

5.2. Machines of parallel hand stitches

The machine has two needles (one sewing one hook needle) which are placed next to each other (there is a left and a right needle). The machine creates two parallel seams on the top fabric surface:

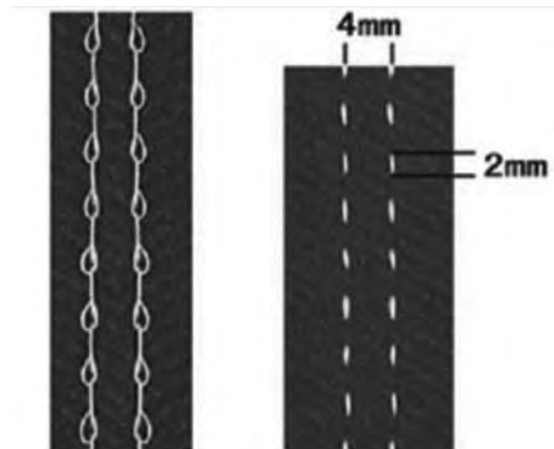


Figure 7: Seams of double hand stitch machines Aurora J400

Slika 7: Šavovi u dva reda mašine Aurora J400

- a seam from a chain of loops,
- a seam of straight stitches (see Fig.8, top).

The distance between the needles (*needle gauge*) determines the distance between two seams. Parallel hand stitches are seen on the bottom fabric surface (see Fig.2, bottom). The length of the hand stitches is fixed. It depends on the distance between two needles. The length of the stitches/loops of the top fabric surface, as well as, the space between parallel hand stitches is adjustable (4-8mm).

Parallel hand stitch machines are manufactured by companies: *Japsew (J-111P)*, *Sakura Stitch (S-150-A)*, *Topsew (781-HD)*, others.

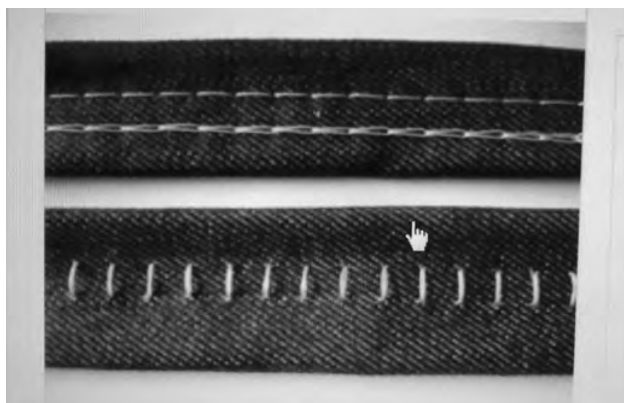


Figure 8: Seams of parallel hand stitches on the bottom fabric surface (bottom)

Slika 8: Paralelni ručni ubodi na donjoj strani materijala (dole)

5.3. Machines of angular hand stitches

The machine has two needles (one sewing one hook needle) which are placed next to each other (there is a left and a right needle, see Fig.9), but on needle is fixed more forwards, other one - back-

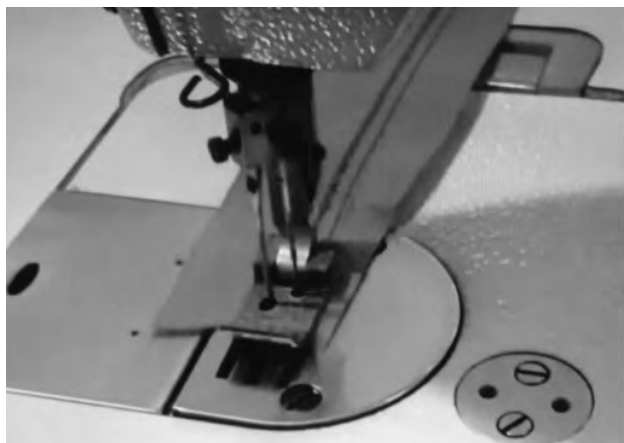


Figure 9: Placement of needles on an angular hand stitch machine

Slika 9: Položaj igala za izradu kosih ručnih uboda

wards. They create two parallel seams on the top fabric surface - one of them is formed from a chain of loops, other one - from straight stitches. Angular hand stitches are seen on the bottom fabric surface (see Fig.10).

The distance between the needles (*needle gauge*) determines the distance between two parallel seams. The length of the stitches/loops of the top fabric surface, as well as, the space between angular hand stitches is adjustable (4-8mm, 2-8mm). The distance between two needles and length of the angular hand stitches is fixed (6mm).

Angular hand stitch machines are manufactured by companies: *Japsew (J-111)*, *Sakura Stitch (S-150-B)*, *Aurora (J111)*, others.

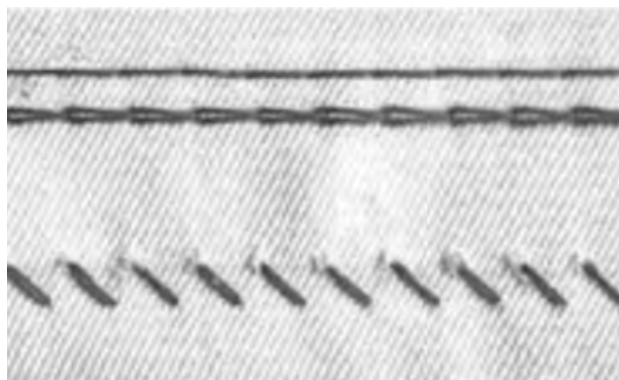


Figure 10: Seams of angular hand stitches on the bottom fabric surface (bottom)

Slika 10: Izgled kosih uboda na donje strane materijala (dole)

6. CONCLUSIONS

1. Chain type hand stitch machines comparing with real hand stitch machines have important advantages: higher productivity as sewing speeds are 4-5 times higher and there is no need to cut thread in limited length, as well as, their price is up to 5 times lower.
2. Chain type hand stitch machines also have several disadvantages: they can be used for stitching seams which are seen from one side only; stitch length is limited and depends on a fixed distance between two needles; bottom feed system cannot ensure qualitative seaming of thick material packets/many fabric plies and there is higher thread consumption as every hand stitch is formed from two threads and on the top fabric ply chains are formed.

3. Depending on the advantages and disadvantages of the both kind of the machines, they have very certain application in men suit manufacturing process: real hand stitch machines are used for decorative stitching of collars, lapels, pocket flaps, while chain type hand stitch machines are mostly used for stitching of lining.
4. Both type machines which currently can create imitation of hand stitches are important sewing equipment and are widely used in traditional men suit manufacturing process.

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Primljeno/Received on: 26.08.2022.
Revidirano/ Revised on: 26.09.2022.
Prihvaćeno/Accepted on: 27.09.2022.

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