

# HAND STITCH SEWING MACHINES IN THE WORLD SEWING EQUIPMENT MARKET

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**Abstract:** Hand stitch sewing machines of stitch types 209 and 104 belong to group of special sewing equipment used to create decorative seams. They are not widely used in garment manufacturing generally, however are must machinery in men suit production. Web-sites of sewing equipment producers were researched to find out the availability of hand stitch sewing machines in the world market. It was found that only 21 companies from researched 143 are manufacturing hand stitch sewing machines. 11 producers sell real hand stitch machines, from them, AFM Reece and Juki develop machines with double pointed needle. 16 producers offer fake/imitation hand stitch machines which create hand stitches only on one material side. The machines use different kind of motors, can be equipped with thread trimming, presser foot lifting backtacking and other advanced mechanisms.

**Keywords:** hand stitches, decorative seams, sewing machines, sewing equipment manufacturers, world market.

## MAŠINE RUČNIH UBODA NA SVETSKOM TRŽIŠTU OPREME ZA ŠIVENJE

**Apstrakt:** Mašine ručnih uboda 209 i lančanih uboda 104 pripadaju kod grupe specijalnih šivaćih mašina koje se koriste za izradu dekorativnih šavova. Ove mašine nisu široko primenjene u proizvodnji odevnih predmeta, međutim su izuzetno važne pri izradi muških odela. Veb-sajtovi proizvođača opreme za šivenje bili su istraživani da bi saznalo dostupnost mašina ručnih uboda na svetskom tržištu. Samo 27 kompanija od 143 istraženih nude mašine ručnih uboda. 11 proizvođača u ponudi imaju mašine pravih ručnih uboda 209, između njih kompanija AFM Reece i Juki izrađuju mašine sa iglama sa dva vrha. 16 kompanija proizvode mašine lančanog uboda 104. Šavovi ovih mašina daju izgled ručnih uboda samo na jedne strane materijala. Mašine ručnih uboda su opremljene sa različite vrste motorima, mehanizma za sečenje konca, podizanje pritisne nožice, osiguranje kraja šava.

**Ključne reči:** ručni ubodi, dekorativni šavovi, šivaće mašine, proizvođači opreme za šivenje, svetsko tržište.

### 1. INTRODUCTION

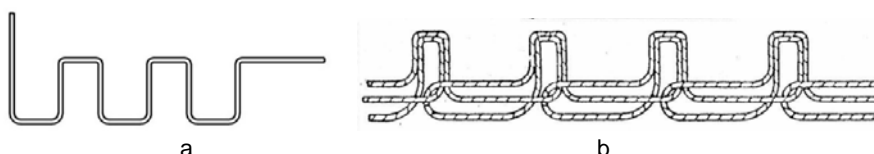
Hand stitch sewing machines (see Fig.1) belong to group of special sewing equipment that are used to create decorative seams on different kind of garments [1,2]. They replace real hand stitch seams created by a tailor's hands and ensure higher seam quality and much higher work productivity demanded by mass production conditions. The most typical application of

the hand stitch sewing machines is found in men suit manufacturing process where hand stitch seams are traditionally placed on collars, lapels, pocket flaps of men jackets. Depending on fashion trends, hand stitch seams use to be popular also in women clothing.

Web-sites of sewing equipment producers were researched to find out the availability of hand stitch sewing machines in the work market.



**Figure 1:** Sewing machine of hand stitches 209 New-tech 3600/1 (a) and a sewing machine of chainstitches 104 Sakura Stitch S-200-DD (b)



**Figure 2:** Hand stitch 209 (a) and chainstitch 104 (b)

## 2. STITCH TYPES

The application of the hand stitch sewing machines depends on a stitch type which they create. There are so called *real hand stitch* machines which perform original hand stitches 209 (see Fig.1a,2a and Fig.3), [3,4] Other kind and mechanism machines create so called *fake/imitation hand stitches* - chainstitches 104 which are similar to original hand stitch from one fabric side only (see Fig.1b,2b and Fig.3), [5].

Comparing with other types of sewing machines, such as, lockstitch, overlock and interlock machines, hand stitch machines are rarely found in the market.

Only 14% - 21 companies from researched 143 are manufacturing hand stitch sewing machines.



**Figure 3:** Visual appearance of seams from stitches 209 and 104

**Table 1:** Hand stitch machine companies

	Company	Machines of stitch 209	Machines of stitch 104		Company	Machines of stitch 209	Machines of stitch 104
1.	AMF Reece	+		12.	Jocky	+	+
2.	Juki	+	+	13.	Highlead		+
3.	Foxsew	+	+	14.	Presious		+
4.	Japsew	+	+	15.	Gute		+
5.	Global	+	+	16.	Zoja		+
6.	Complett	+		17.	Atlas		+
7.	Worldmac	+		18.	UnionSpecial		+
8.	Sakura Stitch	+	+	19.	Justta		+
9.	GoldenWheel	+		20.	Sera		+
10.	Fucen	+	+	21.	FDM		+
11.	New Tech	+					

### 3. MACHINES OF STITCHES 209

Researching web-sites of sewing machine manufacturers it was found that 11 companies are producing real hand stitch sewing machines (see Table 1). On the bases of different stitch creating mechanisms the machines can be divided in two groups (see Table 2):

- machines with a double point needle;
- machines with a hook/bearded needle.

Company AMF Reece and Juki are only manufacturers that use a double pointed needle and floating needle system patented by AMF Reece [4]. There machines FLS-350 (Juki) and Deco 2000 (AMF Reece) create the highest quality hand stitch seams, however they are the most expensive in these group of machines. Other producers use a hooked/ bearded needle to create hand stitches (see Table2). All companies produce their machines with energy saving servo motors (direct drive or with a belt connection), [7,8]. Intelligent hand stitch machines use also stepper motors to perform independent presser foot lifting, automatic thread trimming and stitch condensation at the end of a seam. The most part of the machines available in the market have half stitch feature, positive-negative/ reverse stitch function, backtacking/ stitch condensation, thread cutting device (to cut the thread in needed length from a large capacity cone), [4].

Comparing with other kind of sewing machines the real hand stitch machines have very low speed (one of the reasons of it is fact that one stitch is formed

in two full rotations of the main shaft of a machine). Heavy duty machines for denim and leather processing create only 300-400 stitches/min, the machines for other materials - 500-600 stitches/min. There is one more serious disadvantage - because of complicated stitch formation mechanism real hand stitch machines are very expensive.

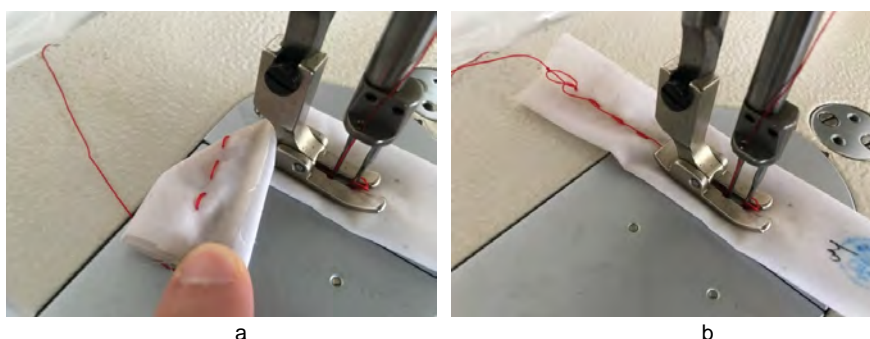
### 4. MACHINES OF STITCHES 104

It was found that 16 companies are produced machines of chainstitches 104 (see Table 1). By help of two needles (one standard and one hook needle), these machines create *fake hand stitches* - the hand stitches are formed only on the bottom side of the material and during the work process the operator cannot see them. On other/top side of the fabric there is chain of thread (see Fig.4) which does not have any functional or decorative application [5]. Comparing with seams of stitches 209, thread consumption is much larger.

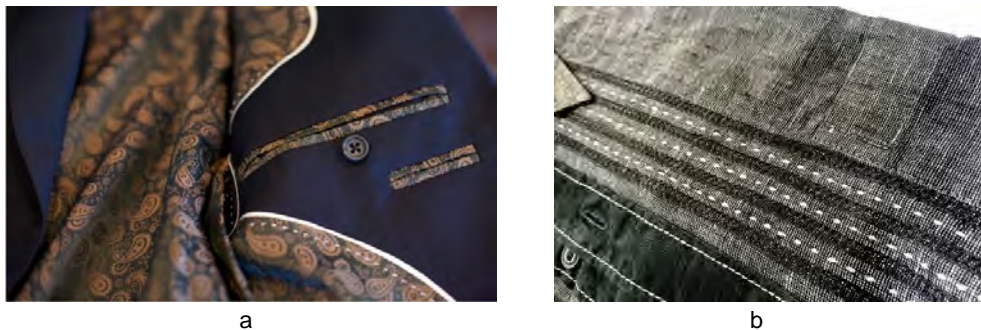
Seams of hand stitches 104 can be used in places where they are seen from one side only on ready goods. They are typically used to create decorative seams on a lining of man jackets (see Fig.5). Machines of chainstitches 104 are manufactured with clutch, servo motors or direct drive motors [7,8], can be equipped with thread trimming and needle positioning mechanisms. The machines differ in a fixed gauge size - the length of hand stitches which can be creat-

**Table 2:** Companies of hand stitch 209 machines

	Company	Double point needle	Hook needle		Company	Double point needle	Hook needle
1.	AMF Reece	+		7.	Complett		+
2.	Juki	+		8.	Worldmac		+
3.	Foxsew		+	9.	Sakura Stitch		+
4.	Japsew		+	10.	Fucen		+
5.	Global		+	11.	GoldenWheel		+
6.	New Tech		+				



**Figure 4:** Hand stitches seen on the bottom side of the fabric (a) and a top fabric side (b)



**Figure 5:** Hand stitch seams on a lining of a jacket (a), and on a shirt (b)

ed on a bottom side of the material [5]. For example, available machines with gauge sizes are:

- Jap sew: 1.5mm, 2.0mm and 2.5mm;
- Juki: 1,6mm and 5,0mm;
- Global: 1,8mm and 4,0mm;
- Precious: 2.1mm, 2.4mm, 3mm, 4mm.

Although the machines of stitches 104 do not create original hand stitches, they have several advantages comparing with the machines of real hand stitches 209:

- the stitch creating mechanism is simpler;
- stitching speed is 1200-2000 stitches/min;
- the machines can work with endless threads fed directly from large capacity cones;
- the price of a machines is much lower.

## 5. CONCLUSIONS

Hand stitch seams are not widely used in garment manufacturing generally. Only 18% (27 companies) of 143 researched companies produce hand stitch sewing machines. However, they are typical and important machinery in men suit production [11]. The most qualitative hand stitch imitation can be obtained using machines of stitches 209. In the world market 11 producers offer real hand stitch 209 sewing machines. The machines of stitches 104 give visual appearance of hand stitches from one side only consuming much more thread. Machines of stitches 104 are more available in the market (16 producers), they are lower priced and have higher stitching speed.

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