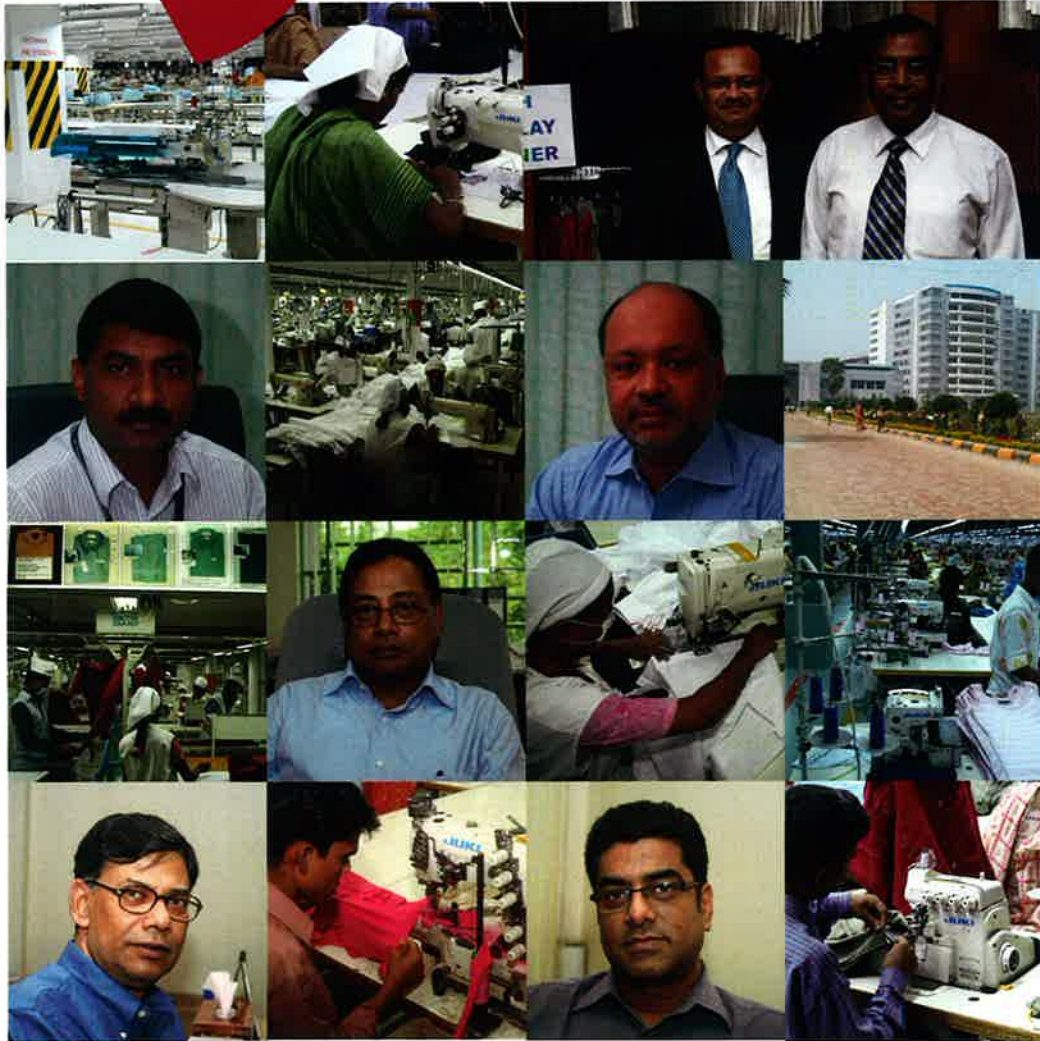


For future garment production

jim

2008
5

JUKI Magazine International



<Special series: Bangladesh---Top interview>

- 2 The company introduced JUKI sewing machines from the beginning based on the quality first policy.
The export of denim products is rapidly growing mainly to the US.

HA-MEEM GROUP : Md.Delwar Hossain , Deputy Managing Director
Interviewer: Abdullah Siddiqui Nizam, Asst. General Manager, JUKI BANGLADESH LTD.

<Special series: Bangladesh>

- 6 A group of companies is undertaking integrated manufacturing from material to end product.
They are nurturing high technology aiming to make a contribution to the local community and fair trade.

Interfab Shirt Mfg. Ltd. : Mr. Ahasan Kabir Khan, Managing Director
Mr. Fateh-UI Islam, COO

<Special series: Bangladesh>

- 8 The management strategy for the next 25 years is reviewed every 5 years.
Targeting the nurturing of multi-skilled operators.

The Cotton Group: Mr. M. M. Rahman, Director and CEO
Mr. Mir Azizul Karim, Executive Director
Mr. Paresh Chandra Debsharma, Vice President

<Helpful hints about sewing 5>

- 10 Throat plate for the overlock machine

<Plant streamlining series No. 4>

- 12 Functions and utilization of the sewing machine with an automatic thread trimmer

<Information>

- 15 The "JIAM" International Apparel Machinery Trade Show 2008 was held in Singapore.

The company introduced JUKI sewing machines from the beginning based on the quality first policy. The export of denim products is rapidly growing mainly to the US.

HA-MEEM GROUP : Md. Delwar Hossain, Deputy Managing Director

Interviewer: Abdullah Siddiqui Nizam, Asst. General Manager, JUKI BANGLADESH LTD.

The official name for Bangladesh is the People's Republic of Bangladesh. In 1947, the country became independent from the British colony of India as Pakistan, and later in 1971, after 9 months liberation war the east half of Pakistan became Bangladesh. Half of the population consists of the generation born after the independence as Bangladesh, and there are less and less people who know the relationship with Pakistan. Most of the border lines in the West, North and East are shared with India, and there is a short border line with Myanmar to the South. Approximately 140 million people live in this land of 147,570 km², which makes the population density very high. The capital of the country is Dhaka with approximately 10 million people, and the language is Bengali.

In terms of the country's economy, the growth rate is as high as 6.71% in 2005 and 6.51% in 2006. However, this growth rate is not so high when compared to other countries in fast growing Asia. Some of the reasons are considered to be an insufficient infrastructure, unstable political and social situation and complicated administrative processes for obtaining government approvals. Most of the country is flat, and the southern part is a delta area with many rivers. In the dry season, it is quite dry, however, in the rainy season, many parts of the land are submerged. In other words, they are destined to encounter periodical floods, which contribute to the reasons for the country's slow development and prevents further economic development.

In 2006, they recorded 12.17786 billion US\$ in exports and 17.15856 billion US\$ in imports. While their exports increased by 20%, their imports also increased resulting in a trade deficit of 5 billion US\$.

Their major industry is sewing, and textile products account for 67% of their exports. Another major export item is jute products with a 5% share. As such, the country relies heavily on its sewing industry. In the North, cotton is being grown, but the majority of the material for the sewing products for exportation come from China or the US. The improvement of the quality of their own cotton and nurturing of the material industry are major issues.

When looking at the countries exported to, the major customers are the US and European countries, which amount to 28.8% for the US, 16.8% for Germany and 10.0% for the UK. The sewing industry is expected to grow further based on an ample labor force. On the other hand, there is strong pressure from the US and European customers for improved compliance. This is also a major issue for the future.

In this country, the Ha-Meem Group is one of the companies leading the apparel industry.



The company started as a small plant in the city of Dhaka. Now they produce 2.4 million pieces a month.

NIZAM: Your company is one of the leading sewing plants in Bangladesh. I understand that your company was established many years ago.

HOSSAIN: The HAMEEM group was established in 1981, and this is the 26th year for the company. The group started as a trading company handling apparel products and material. It has only been 10 years since we started manufacturing.

NIZAM: When you were mainly trading, what were the major products you handled?

HOSSAIN: Mostly clothing, and we were selling material such as cotton in addition to denim products, cloth products and knit products.

NIZAM: The material for denim is cotton. Do you use domestically produced cotton for denim?

HOSSAIN: We use cotton material imported from the US. Recently, the

quality of the domestic products seems to be improving. However, because our major export customer is the US, we use the US produced cotton.

NIZAM: What was the reason for a trading company to start manufacturing?

HOSSAIN: As we were planning for products and selling those products, the number of our customers increased. We started receiving various requirements from our customers such as sudden increases in production volume or for the development of new items. Gradually we were put in a position where we could not satisfy the requirements in terms of new items, quality and production volume unless we began manufacturing ourselves. That is why we started manufacturing. The first plant was a small one in the city of Dhaka having 5 manufacturing lines. We started with 500 employees. That was 16 years ago.

NIZAM: What is your current organization? I am amazed that you have grown substantially each time I visit. It's hard for me to keep up.

HOSSAIN: We now have 32,000 employees, and we are manufacturing denim jeans, shirts, bottoms, ladies' wear, children's wear, jackets, knit wear and sweaters in 23 plants. In addition to those, we have factories for denim material, washing jeans, manufacturing cardboard boxes and plastic products, and embroidering. In terms of apparel products, we are manufacturing 780 thousand pieces a month of shirts in 20 lines and 1.6 million pieces of pants and overalls in 66 lines, totalling 2.4 million pieces.

90% is exported to the US. "High quality" is the key for repeat orders.

NIZAM: You were exporting from the beginning, as I understand. Who are your export customers?

HOSSAIN: Currently, we export 90% to the US and the remaining 10% to Europe. Based on our production capacity, we consider 8,000 pieces to be the minimum production lot. Exporting to Japan is

difficult because the lot sizes are small and quality requirements are severe.

NIZAM:What are the brands that you produce for?

HOSSAIN:For the US market, Levi's (Kids Head Quarters), GAP/OLD NAVY, JC PENNY, Khol's, VF (Nautica, Lee, Wrangler), OSHKOSH, PVH, TARGET, WALMART, PARRY ELLIS, KELL WOOD, just to name a few.

For the European market, NEXT, H&M, ZARA, CARRE FOUR, TESCO, HEMA, M&S MODE, etc. 55% of the total production is denim products.

NIZAM:We hear that you are receiving more orders than you can handle, and as soon as you expand production capacity, it soon reaches full capacity. You are continually repeating this cycle. We believe that sales efforts are the key for such success. In addition to that, is there anything that you can think of regarding a unique management policy that seems to be working well? I am sure all manufacturing companies would want to increase orders.

HOSSAIN:Nothing special. However, there is one thing we are particular about. That is quality. We aim at quality when introducing new facilities and new technologies. I think those efforts are resulting in favorable assessments of our products.

When constructing the first factory, we had the issue of which machines to install. We selected JUKI because of its reputation as the highest quality machines. Price-wise, there were other attractive offers, but we made our selection because quality was our top priority. Still today, 99% of the machines are JUKI. The remaining 1% are machines not offered by JUKI. So we cannot buy from JUKI even if wanted to.

I believe this is the major factor leading

to the high quality of our products and to the trust of our customers, and eventually to follow-up orders.

Further growth in denim products is expected. Washing capacity is 130,000 pieces a day.

NIZAM:We see that orders are continuously increasing, resulting in the continuous expansion of production capacity with new machines.

HOSSAIN:Yes, even though we are receiving more orders, management of the company is not so easy because of the production capacity expansion. But we are investing in the introduction of new machines. Because new good machines are coming out, and unless we introduce those good machines, we will not be able to satisfy the requirements of our customers, not only in quality, but also in productivity.

NIZAM:You are hiring experienced operators, but at the same time, training non-experienced operators. Similarly, you are putting a lot of effort in the training of sewing machine engineers.

HOSSAIN:That is correct. Even if we have good machines, it will be of no use if the machines stop. Therefore, we put emphasis on the training of engineers. Most of the problems can be fixed by our people, and cases in which we have to ask for JUKI's help are very rare. However, there is one area that we cannot fix. That is the electronics part, as recent sewing machines use a lot of electronics. This is a problem for us.

NIZAM:We are trying to stock enough spares so that we will be able to react immediately when customers have problems. But I guess further improvement will be necessary.

By the way, denim fabric is a relatively new item for your company. And it seems to be growing rapidly.

HOSSAIN:Yes, denim jeans have been manufactured in China and Pakistan since 1992, but production in Bangladesh started only a few years ago. We are manufacturing denim material, too, and 55% of the total output is denim products today. And our washing plant has the capacity to process 130,000 pieces a day.

Technology level is improving by hiring experienced staff. Importance is placed on compliance to laws and regulations.

NIZAM:Because of your rapid growth, hiring an adequate number of operators would be a tough job. Is it?

HOSSAIN:We are constantly hiring operators, and fortunately 90% of our new employees are experienced people. They have experience at other companies. The type of sewing machines used seems to be an important point to the operators, as we understand. We have no problem as far as recruitment is concerned.

NIZAM:You are training new non-experienced employees as well.

HOSSAIN:Yes, we hire not only experienced people but also non-experienced people. Therefore, we have our own training facility in the company for the non-experienced people. Because we are able to hire experienced people, there are not so many non-experienced people. The wage for the operators is 90 dollars/month on average, and it is a fixed salary system instead of the piece rate system.

NIZAM:You are naturally clearing the minimum wage requirement. Right?

HOSSAIN:Yes. In addition to that, we are meeting the requirements for human rights and other compliance issues by implementing safety measures, prohibiting excessive overtime and prohibiting child labor. So the employees seem to have peace of mind in working for our company.

NIZAM:Thank you very much.



Front view of the plant



The new plant under construction. Expansion is made at full speed to meet the yearly growth of the business.

The production line is a chain system consisting of 115 operators. Processes and the machines are arranged to meet the skill level of the operators.

Total of 108 production lines.

As our production volume is increasing every year, it is difficult to tell you the exact number as of this stage. However, in the spring of 2008, 108 production lines were in operation in 23 plants, representing our entire company, producing approximately 2 million pieces per month.

Regarding the types of product, 55% is denim products and 65% of that are bottoms. Of the 108 production lines, 86 are apparel sewing lines.

In addition to the above plants, we have

five denim washing plants with a processing capacity of 130,000 pieces per day. We also have a plant for sand blasting and brushing. We have started to focus more on the post process of the jean products.

In addition to the knit plant where sweaters and other products are being manufactured, we have an embroidering plant as well. While we do not manufacture heavy material clothes, we cover almost all other types.

“The bottoms plant employs a chain system for production, basically, and one line consists of 70 sewing machines and 115

operators. Such a line produces approximately 1,000 pieces a day, or 1,800 pieces in terms of shirts.” Says Mr. KAZI Morshed Ali, General Manager of the plant.

Quality control personnel are assigned to each line, and carefully watch the products. The idea of “no defective products from any process” is firmly set in the mind of the employees.

Daily operational hours are fixed, basically, which is 08:00 to 17:00. Overtime work is limited to 17:00~19:00.



As far as you can see, all sewing machines are JUKI. The latest sewing machines are introduced for the lockstitch, mainly the DDL-8700 with an automatic thread trimmer.

Specifications are displayed in each process, and instructions by the leaders are clearly conveyed to the operators.

“Bottoms account for 65%. The daily output varies depending on the design of the product, but somewhere between 1,000 and 1,500.” Says Mr. ALI (right). He is an old friend of Sk Md. Kamruzzman, Manager of JUKI Bangladesh Ltd.

The latest sewing machines are introduced, supporting the company's high quality production.



① High speed computer-controlled shape-tacking machine, the LK-1930. It is the latest model covering a wide sewing area of 10cmx6cm and having an operational panel which can memorize up to 691 sewing patterns. It is an easy-to-use machine by which various stitching types can be selected by a single touch.



② High speed safety stitch machine, the MO-6716S.



③ 2-needle needle-feed lockstitch machine, the LH-3128. Various gauges are provided for light-weight material, heavy-weight material or jeans/heavy-weight material. Operators praise this machine because of its adaptability to different materials.



④ Computer-controlled eyelet buttonholing machine, the MEB-3200, and high speed computer-controlled lockstitch button sewing machine, the LK-1903, are collectively located in the post process area. The scene where dozens of these machines are lined up is a spectacular sight.



⑤ Lockstitch and Automatic Welting Machines, the APW-895, waiting for their turn to work.

A group of companies is undertaking integrated manufacturing from material to end product. They are nurturing high technology aiming to make a contribution to the local community and fair trade.

Interfab Shirt Mfg. Ltd : Mr. Ahasan Kabir Khan, Managing Director
Mr. Fateh-UI Islam, COO

The Viyellatex Group is undertaking integrated manufacturing from material to end product in only the 10 years since its establishment.

Interfab Shirt Mfg. Ltd. is a plant manufacturing shirts as a member of the Viyellatex Group, a well known textile and apparel company in Bangladesh. Interfab was established in 2003 to manufacture shirts for export as a joint venture business with the Fielding Group of the UK. In only the five years since the founding of the business, the production volume has already reached 500,000 pieces per month. It has grown to be one of the leading plants in the country.

Originally, the Viyellatex Group was founded as Viyellatex (Garments) Ltd. in 1996, and the first business for the company was to manufacture knit products for export. Since then, the following group of companies were established.

- Viyellatex Spinning Ltd.
- Viyellatex Knitting & Dyeing Division
- Interfab Shirt Manufacturing Ltd.
- Textile Testing Corp. (Lab)
- Gothic Design (Printing)
- Fashion Plastic & Packaging

As a result, the group has grown to be the first group of companies in the country covering the entire processes from spinning and design to manufacturing and export.

Interfab manufactures uniforms, casual

wear and dress shirts. Uniforms compose 50%, men's shirts 40%, and women's blouses 10% of the total production. They are 100% exported.

"As we have targeted exportation from the beginning, we have striven to meet global standards such as high quality and short turn-around-time instead of merely relying on cheap labor cost and material. We believe these efforts have been recognized by our customers." Said Mr. Ahasan Kabir Khan, Managing Director of the company.

Customer orders have continued to grow, and the company is now manufacturing for world class brands, including Benetton, Tesco, Gstar, Raw, Marks & Spencer,



Mr. Ahasan Kabir Khan, Managing Director



Mr. Fateh-UI Islam, COO



A plant in Khortail, 40 minutes from Dhaka.



The plant is cool due to the water coolers installed at the windows and is well illuminated. A very comfortable working environment.

s.Oliver, Esprit, Puma, PVH, Arrow, Van Housen and Geoffrey Been.

**Knit material is produced in-house.
The company proposes their own designs
for 70% of the production.**

While there are several unique points about the company, one of them is the fact that the company is producing their knit material in-house. Their material products include cloth products and knit material. As for the knit material, they have a spinning plant, knitting plant and dyeing plant in the group, and they are spinning, weaving and dyeing in-house using cotton purchased from Uzbekistan, the USA, Indonesia, China and Thailand to make circular knitting and flat knitting products.

In other words, they are in a position to propose their own ideas from the material stage, which is proving to be a great advantage for the company.

This approach applies not only to knit shirts, but also to cloth products. For this purpose, the company is training designers, and today they have two designers for shirts and four designers for knit products.

The company intends to further strengthen the design department, and is hiring and training graduates who studied design from the national Fashion Institute,

private universities and technical colleges.

As a result of such effort, 70% of the products of the company today are based on their own designs, and simple sewing work based on customer designs has decreased down to 30%. The company's design department is using the same CAD system as the customer's design department, and in the cutting field, they have introduced automatic spreading machines and Gerber laser cutting machines.

Furthermore, their study of sewing technology is progressing, with US-made washing machines being introduced in their own test laboratory for wash testing.

Because of these efforts, the company's technical capability is highly regarded, and requests for wrinkle free shirts, which do not require ironing and which require a high technical level, are increasing. As shown in the photo, hangers are used in the finishing process. This is evidence that high quality is realized in the manufacturing processes.

**CSR: Contributions to the regional society
including support to primary schools.
The company is aggressive in employing
and training the handicapped.**

Another unique facet of the company is

that they are aggressive in regional contribution activities in addition to their business activities.

Because the company originally grew as an export industry, it can be said that satisfying CSR and other conditions has been part of their plan from the beginning in order to export their products to the US and European countries. Or, perhaps it is the other way around. They may be making their utmost effort in their business operation in order to be able to contribute to the local community.

Of course, as a company, they are not only creating jobs for more than 10,000 people, but also introducing various social contribution programs. Some examples are:

- Supporting the construction and running of primary schools.
- Scholarship system for students.
- Creating funds for establishing non-profit hospitals or purchasing blood transfusion equipment.
- The Marks & Start Program for handicapped (A joint venture with Marks & Spencer to teach machine sewing to handicapped people and in turn have them be hired them by the company.)

These efforts have been recognized, and the company was the first certified in Bangladesh as a fair trade plant by FLO-CERT, which is a fair trade certifying organization in Germany. This achievement was both a source of pride for the company and a great source of motivation for the employees. It is supporting the high quality and high tech level of the company.

Machines with automatic thread trimmer are the main machines for the lockstitch. Dry machines, which do not cause grease stains, have also been introduced into a part of the production line.



1-needle lockstitch machine with an automatic thread trimmer, the DDL-8700-7.



Computer-controlled, High-speed, Lockstitch button holing machine, the LBH-1790.



Hangers are used in the finishing line. Check points in the sewing finishing process for each product are shown on the ceiling above the operators' heads.

The management strategy for the next 25 years is reviewed every 5 years. Targeting the nurturing of multi-skilled operators.

The Cotton Group: Mr. M. M. Rahman, Director and CEO
Mr. Mir Azizul Karim, Executive Director
Mr. Paresh Chandra Debsharma, Vice President

The company started with 32 sets of imported sewing machines. They export 100% of their products, with 60% going to Germany.

“In Bangladesh, the industry for sewn products, knit products in particular, is very active, and the competition among knit sewing plants is getting stronger and stronger. We consider “quality” to be the strength in winning against such stiff competition, and we intend to thoroughly pursue the improvement of our technical capabilities. Operator training is one of the efforts along that line.” says Mr. M. M. Rahman, CEO of the COTTON GROUP.

Our current plant has a floor space of 75,000 m². The ground floor is used for cutting and finishing processes, and the

first floor is used for sewing. A total of 3,000 people are working in the building. Because the shop is getting too crowded, an additional plant is being constructed next door.

This company was established in 1991, having started as a small plant called Cotton N. Cotton Garments Industries in the northern part of Dhaka. There were only 32 sewing machines. “In those days, there was no JUKI distributor in Bangladesh, so we bought the machines from a distributor in India. After that, when the machines reached 400 sets or so, we needed more space and moved to our current location in Mymensingh.”

The plant manufactures knit products, and they make fashion T shirts, polo rugby shirts, trainer sports wear, wind breakers

and parkas in addition to standard T shirts. They export 100% of their output.

The biggest export customer is Germany (60%), followed by France (20%), Switzerland (10%) and Canada (10%). While there was almost no export business to the USA in the early stage, the company eventually started to receive orders from Wal-mart and other customers in the USA. The company expects that their exports to the USA will grow in the future.

When a business grows and competition gets stiff, securing manpower, highly skilled operators in particular, is indispensable. Fortunately, the turnover rate is 2~3% per month in this company. That means more experienced operators are staying, resulting in accumulated technical capabilities.



“The sewing machines from JUKI are the most suitable machines for our plant. We are looking forward to the next ten years as being a WIN-WIN period for both us and JUKI to grow.” Says Mr. M. M. Rahman, director and CEO.



Mr. Mir Azizul Karim, Executive Director.



Mr. Paresh Chandra Debsharma, Vice President.



Front view of the plant.

The company employs a fixed salary system, but the salary increases along with the skill level.

New employees go through a six-month training period.

It is said that the industry average for turnover rate is 20%. One of the reasons for the low turnover rate for this company is a salary system that is unique to this company. The salary system is linked to the skill level, which is a great idea for enhancing the motivation of the employees.

New employees go through a six-month training period. During the first three months, their monthly salary is 1,200 taka. When they learn techniques that are at a level high enough to be able to provide assistance in the production line, the salary will be raised to 1,800 taka. This stage continues for six months. After nine months, the salary will be determined based on the capabilities of each individual.

The basis for calculating the salary level is a unique point system which is linked to the difficulty level of the work. The salary of an operator is determined by taking such points according to his/her assignment into consideration.

“It is also important for the operator to learn higher skill levels and strive for more difficult work. We are providing a system where by the operators will be motivated to acquire higher skill levels.” Says Mr. Mir Azizul Karim, Executive Director in charge

of operation.

An operator will advance starting from a trainee to average skill operator, skilled operator, multi-skilled operator and supervisor according to his/her skill level. A multi- skilled operator who can handle multiple processes will earn 4,000 taka a month. It is the goal for most operators.

Because of such a salary system, operators generally make an effort to stay with the company on a long term basis to acquire skills and earn a higher salary. Currently, our total operators consist of 30% multi-skilled operators, 20% skilled level operators, 30% average operators and 20% trainees. Some of them have over ten years of experience. The system is benefiting both the company and the operators.

The new plant will be expanded floor by floor until 2010.

The company is aiming to be an integrated knit production plant.

The current production line is situated such a way that a high skill level can be recognized, with a line consisting of 34 sewing machines with two supervisors, two QC personnel and one manager.

The company is constructing a new plant next to the existing one. But they are not in any hurry. “Our target is to add floor by floor until 2010 with the eventual goal of an eight storied building. The ground floor

will be a knitting plant, the first floor will be a print plant, the second to the fourth floors will be a cutting and sewing plant, and the fifth to the seventh floor will be a spinning and dyeing plant.” According to Mr. Paresch Chandra Debsharma, vice president of the company.

Now our monthly output is 1 million 200 thousand pieces. When the new plant is completed, the monthly output will be increased to 2 million pieces due to additional exports to the USA. When the new plant is completed, the company will become an integrated manufacturer covering from material to end products.

“It is important for a plant to grow steadily. And for that purpose, the key word is “honesty”. It is more important to sustain a steady growth over a period of time rather than making a rapid growth. We are implementing a method whereby the management of the company is planned for the next 25 years and to review the plan every five years. During the next 25 years, we would like to continue our growth on a WIN-WIN basis with JUKI.” Says Mr. Rahman.

As they used the word “honesty”, the company is strictly complying with the requirements for “no child labor”, “ergonomic working environment” and “sanitation for staff and workers according to ISO standards”. The company, it would appear, is a good place to work for its employees.



The spacious plant is well illuminated and clean, and a comfortable working environment has been created by the introduction of a evaporative cooling system.



Sewing machines are 100% JUKI, mainly consisting of the overlock machines.



High speed cylinder-bed 3- needle top and bottom coverstitch machine, the MF-7823.



High speed 2-needle overlock machine, the MO-6714S.

Helpful hints about sewing

5

Basic knowledge about the overlock machine Throat plate for the overlock machine

The overlock machine is a basic type of sewing machine that is a lockstitch machine. The lockstitch machine can be used for sewing any part of a sewing product. The overlock machine, however, has a specific feature of sewing in the edge of one or two pieces of material fabric while cutting and hemming the edge. With this feature, the overlock machine is usually used for preventing the fabric edge from raveling and for sewing heavy-weight products such as car mats and highly elastic knits.

Typical stitch systems of the overlock machine are 1-needle overlock, 2-needle overlock and 2-needle safety stitch (Fig. 1).

1. Kinds of throat plates for the overlock machine

In this issue, components of the throat plate for the overlock machines are described (Fig. 2). The throat plate differs with the aforementioned three kinds of stitch systems.

2. Configuration and function of throat plates for the overlock machine

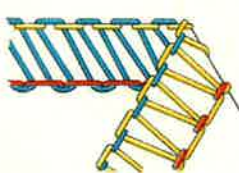
(1) Configuration and function of the throat plate for the 1-

needle overlock machine

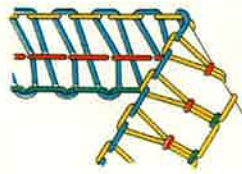
The throat plate for the overlock machine is as illustrated in Fig. 3.

- ① Location of the auxiliary feed dog teeth
 - The auxiliary feed dog teeth helps produce chain-off thread with consistency.
- ② Overedging width
 - The overedging width (Fig. 4) differs with the width of the overedging claw.
 - A - The claw width determines the overedging width.
 - B - Thread tension varies according to the entire length.
 - C - Needle entry
- ③ Location of a cloth cutting knife
 - The fabric is cut here. The cutting width is determined by the location of the knife.
- ④ Feed dog groove
 - The feed dog for the 1-needle overlock machine comes in three different types, i.e., feed dog with 1 row of teeth, feed dog with 2 rows of teeth and feed dog with 3 rows of teeth.

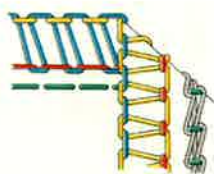
Fig. 1 Kinds of overlock machines



1-needle overlock
1-needle, 3-thread
Stitch style: 504
Application: Runstitches for general fabric and knits
MO-6△04 Series

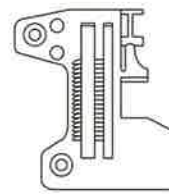


2-needle overlock
2-needle, 4-thread
Stitch style: 514
Application: Overedging for knit fabric with a wider overedging width
MO-6△14 Series

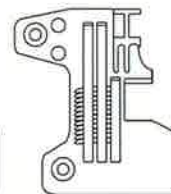


2-needle safety stitch
2-needle, 5-thread
Stitch style: 515
Application: Safety stitch for men's shirts, fabric and knits
MO-6△16 Series

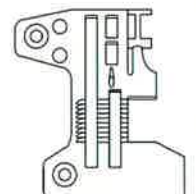
Fig. 2 Throat plate for the overlock machine



1-needle overlock
MO-6△04 Series



2-needle overlock
MO-6△14 Series



2-needle safety stitch
MO-6△16 Series

Fig. 3 Throat plate for the overlock machine

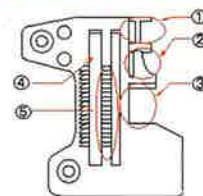
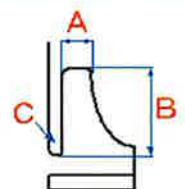


Fig. 4 Overedging width



-Efficiency of feed and straight feeding capability of the feed dog increases with the number of teeth.

-The feed dog with 1-row teeth is characterized by its ability to support sharp-curve sewing.

⑤ Throat plate slot

-The slot prevents the feed mechanism from returning (in prevention of an uneven pitch). The slot also works to improve the differential effect.

(2) Configuration and function of the throat plates for the 2-needle overlock machine

The throat plate for the overlock machine is as illustrated in Fig.5.

⑥ Needle entry section

The structure of the needle entry section is as illustrated in Fig. 6.

⑦ Feed dog groove

-The feed dog for the 2-needle overlock machine comes in three different types, i.e., feed dog with 2 rows of teeth, feed dog with 3 rows of teeth and feed dog with 4 rows of teeth.

(3) Configuration and function of the throat plates for the 2-needle safety-stitch machine

The throat plate for the safety stitch machine is as illustrated in Fig.7.

Fig. 5 Throat plate for the 2-needle overlock machine

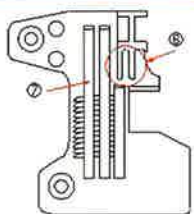


Fig. 6 Structure of the needle entry section

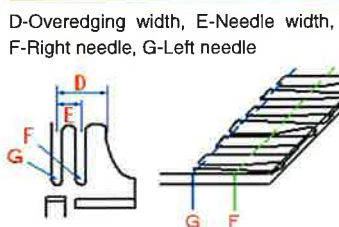
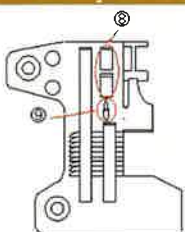


Fig. 7 Configuration of the throat plate for the safety stitch machine



⑧ The right side of the main feed dog teeth feeds thread to form double chain stitches (This part is important for producing chain-off thread stitches).

⑨ Needle entry of double chain stitches

The slot in the rear side of the throat plate has two roles. The first role is to tense the needle thread with a lower thread tension application. The second one is to prevent stitch skipping when producing chain-off thread.

3. Other stitches produced by the overlock machine

① Overlock machine

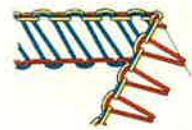
1-needle, 2-thread Stitch style: 503

Application: Decorative stitch for handkerchiefs, serging, etc.



1-needle, 3-thread Stitch style: 505

Application: Bottom hemming



2-needle, 4-thread Stitch style: 512

Application: Imitated safety stitch for general fabric



② Safety stitch

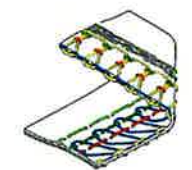
2-needle, 4-thread Stitch style: 515

Application: Safety stitch for fabric including men's shirts and knit fabric



3-needle, 6-thread

Application: A 3-needle, 6-thread machine is able to sew two different stitches, i.e., an overlock stitch and a double chain stitch. It is characterized by its wide overredging width and durable seams.



When the needle for the double chain stitch is removed, leaving two needles, the machine can be used as a 2-needle overlock machine. When one of the two needles for the 2-needle overlock stitch is removed, the machine can be used as a safety stitch machine with a wide overredging width.

Functions and utilization of the sewing machine with an automatic thread trimmer

Labor costs are showing an upward tendency in many countries due to the rapid increase in crude oil prices. Sewing plants have to achieve an increase in productivity with greater urgency.

JUKI launched its lockstitch machines with a thread trimmer in 1969. In the 70's, lockstitch machines with a thread trimmer spread rapidly among sewing plants in Japan. As a result, "lockstitch machine = lockstitch machine with an automatic thread trimmer" became the standard. The basic performance of the sewing machine with a thread trimmer is that it is capable of automatically trimming the thread. Now, let's check the advantages of the lockstitch machine with a thread trimmer for sewing plants.

Sewing Research Institute
Hiroyasu Asai

1 Evolution of the sewing machine with an automatic thread trimmer

<Basic functions of the lockstitch machine with a thread trimmer>

During the corner stitching process in sewing work, the operator needs to stop the machine with its needle down (with the needle penetrating the material) to change the direction of stitching. At the end of sewing, the operator needs to raise the needle and pull out the thread to trim it. Normally, therefore, when sewing with a lockstitch machine, the operator has to operate the pulley and/or to trim the thread with a pair of scissors when sewing a corner part of the material and at the end of sewing. When sewing with a lockstitch machine with a thread trimmer, the operator is not required to carry out the aforementioned actions since the machine automatically performs them.

While the lockstitch machine with a thread trimmer makes a half revolution from the "needle-down stop position" to the "needle-up stop position," the thread trimmer works to activate the trimming knife. The lockstitch machine with a thread trimmer, therefore, has (1) a thread trimming knife function for trimming the thread, (2) a needle position control function (stop with the needle up/down, etc.) and (3) a function for controlling the machine's number of revolutions.

<The lockstitch machine with a thread trimmer is evolving>

The lockstitch machine with a thread trimmer these days is provided not only with the previously mentioned basic functions, but also with lots of additional functions, including those described below, to evolve into a substantially easier-to-use machine in comparison to the regular lockstitch machine.

- Touch-back switch is installed near the needle entry zone

- The machine automatically performs reverse stitching by the specified number of stitches
- The machine automatically stops when it finishes sewing of the specified number of stitches
- Maximum speed restriction, which enables the easy setting of a speed suitable for the material
- The pedal which drives the machine can be operated with a lighter pressure and is able to change the startup speed of the machine
- Easy-to-use machine allows inexperienced operators to fully utilize its capabilities in a short period of time
- The machine is provided with an automatic presser lifting feature which lifts the presser foot using a light-to-operate knee switch
- A subclass model which employs a non-lubricating mechanism for totally preventing oil stains on sewing products
- The latest 9000 Series has a bobbin winder which is located near the operator (the bobbin winder is mounted on the machine head)
- The dial for adjusting stitches is ergonomically designed for achieving ease of operation
- The distance from machine arm to needle is increased for easier handling of the material being sewn
- Air is blown from the clearance between the pulley and the main body in order to prevent thread from tangling

The new needle-feed machine (DLN9010) has been designed to be adaptable for use as a lockstitch machine by exchanging the gauges. Lots of improvements have been employed to achieve ease of operation for users and to improve the effectiveness of the machine.

2 Effects of the introduction of the lockstitch machine with a thread trimmer for sewing plants

Let's see the lockstitch machine with a thread trimmer in terms of

the benefits (effects) of its use in sewing plants.

(1) Increase in productivity (reduction in processing time)

Operations become easier by introducing lockstitch machines with a thread trimmer, thereby reducing the working hours. The effect greatly varies depending on the operator, process in which the machine is used and material to be sewn. In some cases, the increase in productivity in the entire production line exceeds 20 %. By comparing and analyzing the operating activities between the regular lockstitch machine and the one with a thread trimmer, a difference in the processing time can be grasped. The effect of using the lockstitch machine with a thread trimmer is obtained based on the activity in different processes and the resulting productivity calculations. The results are summarized in Table 1.

(2) The machine is free from operator habits

For machines which employ a clutch motor, the operator controls the number of revolutions by operating the foot pedal. As a result, the machine is likely to adapt to the operating habits of the operator. When an operator has to use a machine which has been used by another operator, it takes him/her time to become familiar with the machine and operate it as usual. In addition, in this case, the operator is likely to make mistakes during work until he/she gets used to the machine.

For the lockstitch machine with a thread trimmer, the number of revolutions is electronically controlled. This means that the machine does not adapt to the operator's habits. This is advantageous to any operator since he/she is able to immediately operate the machine with a thread trimmer at his/her own pace. In addition, the supervisor may be free to change jobs assigned to operators, thereby facilitating production line management. This is a great benefit to a sewing plant which employs a various-kind small-lot production system.

(3) Easy setting of the sewing speed

A buyer's first concerns are the purchase price and quality. For the buyer, an important theme is that the plant "is really capable of producing products of a consistent quality." In recent years, materials have become more and more diversified, including soft or light-weight types which need to be sewn at a lower speed. The lockstitch machine with a thread trimmer is provided with a maximum sewing speed limiting function. This function also works to prevent defective products. The sewing machine with an automatic thread trimmer is a piece of equipment with an enormous appeal to buyers.

The machine's speed limiting function is also advantageous to sewing plants as they can smoothly proceed with the training of new recruits by using the function.

(4) Reduced frequency of troubles in sewing

Sewing machine failures or troubles directly contribute to reduced productivity. Important points of a sewing machine are ease of maintenance, minimal failures and consistent operation. JUKI's thread trimming mechanism is of the horizontal type for cutting the thread by nipping. This mechanism demonstrates consistent performance since it is rarely affected by the thread count or thread tension.

The machine is also provided with a presser-foot micro-lifting mechanism for improving the consistency in seam quality. This mechanism is another advantageous point to sewing plants which use light-weight materials with respect to the prevention of troubles in sewing.

<Summary>

A factor responsible for the popularization of the lockstitch machines with a thread trimmer is the effect of increasing productivity. At the same time, the machine is also evaluated as being easy to operate and use. In Japan, the lockstitch machines

Table 1 Example of a reduction in working hours (Actual value)

Type of product	Process name	Skill level	Net working time (in sec)		Reduction in time (in sec)	Reduction ratio
			Regular lockstitch machine	Machine with a thread trimmer		
Slacks	Runstitch welt of hip pockets	C	36.4	33.7	2.7	7.4%
	Topstitch lower welt of hip pockets	B	11.3	9.5	1.8	15.9%
	Counterstitch edge of hip pockets	B	7.4	6.5	0.9	12.1%
	Topstitch upper welt of hip pockets	B	21.1	17.5	3.6	17.0%
	Topstitch edge of side pockets	A	16.5	16.0	0.5	3.0%
	Counterstitch edge of side pockets	A	6.5	5.2	1.3	20.0%
	Reinforcing stitch top and bottom of side pockets	A	18.2	13.0	5.2	28.5%
	Sew stay to side pockets	B	14.7	10.5	4.2	28.5%
	Sew ticket pocket to side pockets	B	13.5	11.0	2.5	18.5%
	Sew bottom of side pocket bags	B	12.3	8.0	4.3	34.9%
	Topstitch side pocket bags	A	14.1	12.5	1.6	11.3%

with a thread trimmer had been introduced in a period when the labor shortage and increased wages were becoming serious. Sewing plants in Japan competed with each other in introducing the lockstitch machines with a thread trimmer as a strong weapon which helped secure a work force and ensure its stability.

Thereafter, the Japanese apparel industry has undergone further improvements in quality and diversification of materials. Each sewing plant has been aiming at the manufacturing of products making the best out of its features. To support the achievement of this aim, subclass models for the lockstitch machine with a thread trimmer, such as a bottom & variable top-feed machine and needle-feed machine have become popular. For the bottom and variable top-feed machine, not only its capabilities of sewing beautiful gatherings or of handling slippery materials for increasing productivity and ensuring consistent quality, but also its strategic benefits such as differentiation from competitors and substitution of

skilled techniques have received attention.

The effect of any piece of equipment varies depending on how it is used. It is important for sewing plants to continue to investigate how to make the most out of the equipment for ensuring its superiority in terms of the increase in productivity, consistency in quality and securing of manpower.

Table 2 Provisional calculations of the increase in productivity organized by type of clothing (Provisional calculations by comparison of operation)

	Men's shirts	Slacks
Comparison of processing time (sec)		
Using a regular lockstitch machine	1004	1904
Using the machine with a thread trimmer	847	1573
Reduction in time	157	331
Reduction rate	15.6%	17.4%
Comparison in terms of line organization		
Number of sewing machine operators	50	55
Quantity of output (daily output/number of products)		
Using a regular lockstitch machine	1103	640
Using the machine with a thread trimmer	1308	775
Increase in the number of products (daily)	205	135
Increase ratio	18.6%	21.1%
Comparison of the number of facilities in use		
Number of regular lockstitch machines in use	37	34
Number of machines with a thread trimmer in use	34	29
Effect of the increase in revenue and facility investment		
e.g.Price of the machine with a thread trimmer (\$)	1400	1400
e.g.Processing fee (CMT, \$)	1	2
Investment amount \$(Provisional)	47600	40600
Increase in revenue (per day, \$)	205	270
Increase in revenue (25 days, \$)	5125	6750
Increase in revenue (per year, \$)	61500	81000

Supplementary explanation 1 (Table 1)

The operation analysis results are gathered based on the following data:

(1) For each product item, the operation by means of a lockstitch machine and that by means of a machine with a thread trimmer are compared. Time required for thread trimming (effect of the use of the machine with a thread trimmer: 2.6 sec per thread trimming)

* Operating time using a regular lockstitch machine
 (1) Turn the pulley of the sewing machine at the end of sewing
 (2) Stop the machine with its needle up
 (3) Draw out the material and trim the thread with a pair of scissors
 In total, 3.1 sec is required for carrying out the aforementioned steps (1) to (3) in sequence.

* Operating time using the lockstitch machine with a thread trimmer
 (1) Depress the pedal using the heel. The machine trims the thread.
 The machine time is 0.5 sec.

Difference in time between the two models:
 3.1 sec - 0.5 sec = 2.6 sec
 Time saving effect of the use of the machine with a thread trimmer:
 2.6 sec

Similarly;

Corner stitching (effect of the use of the machine with a thread trimmer is 1.6 sec per location of a corner part).

Reverse stitching (effect of the use of the machine with a thread trimmer is 1.2 sec per reverse stitching operation).

For Table 1, the aforementioned three points regarding the effects are subject to operation analysis and comparison on a process-by-process basis to calculate the reduction in time required for each process. In this case, the operator is assumed to have an average level of skill.

Supplementary explanation 2

The effect of an increase in revenue is calculated by multiplying the increase in the number of products produced along with the increase in productivity by processing fees (provisional values are entered in the CMT table). This represents the direct effect of the use of the lockstitch machine with a thread trimmer for a sewing plant.

The "JIAM" International Apparel Machinery Trade Show 2008 was held in Singapore.

At this Trade Show, JUKI exhibited various models ranging from new ones to major ones, 57 industrial sewing machines, and 14 household sewing machines.

At JUKI's 1080-m² booth, which was the largest among the participants, not only were there the exhibited models, but there was also an IE Support section showing the intelligent panel (IP), which is capable of measuring data; A Technical Solution section for introducing the latest and most unique technologies; and Customer Support section for introducing before-/after-sale customer-support menus and broad customer-support activities, including demonstrations

of attachment making and sewing that attracted numerous visitors, exhibiting JUKI's appealing comprehensive technical capabilities and service capabilities.

JUKI will keep challenging itself from many different points of view aiming at the achievement of the highest customer satisfaction with its new concept "Be the Best in CS."



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Capabilities for sewing car seats
have been significantly improved.



- Thread nipping work required at the beginning and end of sewing is reduced. This is a high-performance machine which contributes to both increased productivity and improved quality for sewing car seats.
- Since the thread trimming mechanism has been totally redesigned to shorten the length of thread remaining on the material at the end of sewing down to 5 mm, frequency of the use of scissors by the operator is reduced, thereby helping prevent the material from being damaged.
- The needle thread does not remain on the right side of the material at the beginning of sewing.
- 2-pitch dial type can instantaneously select one of two different stitch lengths according to the application.

**High-speed, 1-needle, Unison-feed, Lockstitch Machine
with Vertical-axis Large Hook and Automatic Thread Trimmer**

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