CHAPTER - 1

Introduction to Garment Assembly Systems

Garment Assembly

Most of the people who sew clothes at home or have seen their mothers, grandmothers, aunts or tailors sew, know that a garment is assembled by putting together various components of it such as fabric pieces, thread, buttons, zipper, and so on.

Garment construction involves conversion of raw material into a stitched and wearable piece of clothing. It is a basic requirement of clothing and fashion design. Garment construction involves creating a three-dimensional garment from a two-dimensional design /pattern/ fabric.

Various parts of a garment, say, a shirt requires assembling to make a complete garment. The front and the back body, sleeve, cuff, placket, yoke, collar and pocket need to be assembled together in order to make a shirt.

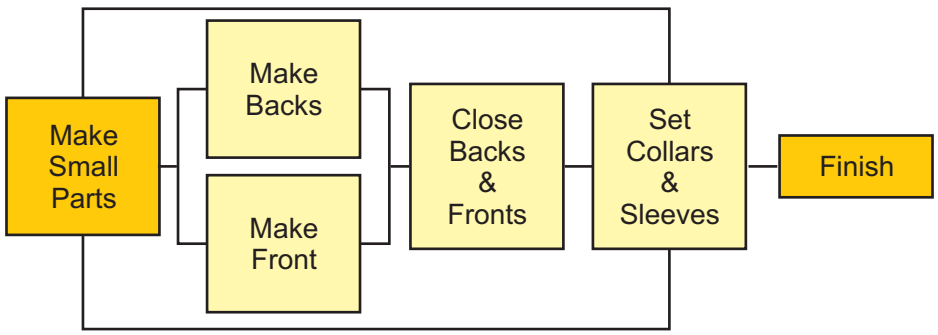

Figure - 1: Layout & Workflow

1.1 Garment Assembly Systems

The garment assembly system used by an individual or in small tailor shops is different from the systems used in the factories. The production system in the factories follows a production process to manufacture a garment and put its components together. The basic garment components according to Glock and Kunz (1995) include:

- Top fronts and top backs
- Bottom fronts and bottom backs
- Sleeves
- Collars and neckline treatments
- Cuffs and sleeve treatments
- Plackets
- Pockets
- Waistline treatments

Hems, stitches, seams, bonding, fusing, or combination of these, is used to assemble the garment components into a complete structure. The more components a garment has, the more complex the assembly and higher the labour costs.

1.1.1 Individual System

This is traditional method of sewing and assembling a garment whereby one operator puts together the entire garment. The operator cuts the fabric and does every operation required to make the garment, including machining, hand work and pressing. The operator sews the garment according to his or her own method of work. This type of garment assembly system is effective when varieties of garments are required to be produced in very small quantities. Individual system of assembling garment is more common with homemakers, local tailors, boutiques, etc.

1.1.2 Factory Production System

There are various ways used in the clothing factories for assembling a garment. The choice of best assembly system depends on the product and production & pricing policies of the company. Most of the garment assembly systems employed in clothing factories are derived from the following manual or mechanical systems. Each system has its own characteristics.

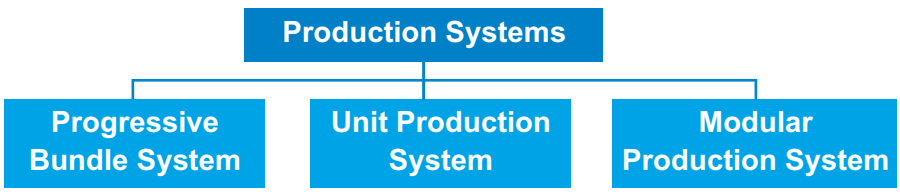

Figure - 1: Production Systems

1.2 Garment Assembly Systems Commonly used in India

There are three types of garment assembly systems commonly used in India in mass production of apparel. Each system requires an appropriate management philosophy, materials handling methods, floor layout, and employee training. Factories may use only one system, a combination of systems for one product line, or different systems for different product lines in the same plant to meet their specific production needs. These systems are:

1. Progressive Bundle System
2. Unit Production System
3. Modular Production System

1.2.1 Progressive Bundle System (PBS)

In the Progressive Bundle System the bundles of garment parts are moved in a sequence from one operation to another. The operators specialise in one major component and sew it from beginning to end. The garments are gradually assembled as they move through successive sub-assembly and main assembly operations in bundle form. This system, often referred to as the traditional production system, has been widely used by apparel manufacturers for several decades and still is today.

Bundles are assembled in the cutting room where cut parts are matched up with corresponding parts and bundle tickets. Bundles of cut parts are transported to the sewing room and given to the operator scheduled to complete the operation.

Bundles consist of garment parts needed to complete a specific operation or garment component. For example, an operation bundle for pocket setting might include shirt fronts and pockets that are to be attached. One operator is expected to perform the same operation on all the pieces in the bundle, retie the bundle, process coupon, and set it aside until it is picked up and moved to the next operation.

Under this system of assembling garment, the sewing room would have a number of sections, each containing versatile operators capable of performing the operations required for a specific component.

CUFFS	CUFF HEM	BUTTON HEM	
	CUFF R/S	CUTT R/S	
	CUFF TURN / TRIM	CUFF FINISH	
SLEEVES	SLEEVE OPEN	CUFF SETTING	ASSEMBLY II
	SLEEVE PLK ATTACH	CUFF SETTING	
	SLEEVE PCK FINISH (B)	SIDE TOP STITCH	
	SEELVE PCK FINISH (C)	SIDE ATTACH	
COLLAR	COLLAR R/S	SLEEVE T/S	
	COLLAR TURN	SLEEVE ATTACH	
	COLLAR TOP IRON	SLEEVE SETTING	
	COLLAR T/S	COLLAR FINISH	
	PICK A HEM	COLLAR FINISH	ASSEMBLY I
	PICK ATTACH	COLLAR ATTACH	
	PICK CUTTING	COLLAR SETTING	
	POCKET IRON	SHOULDER T/S	
FRONTS	POCKET HEM	SHOULDER ATTACH	
	POCKET MARKING	SHOULDER JOIN SET	FRONT
	POCKET IRON	POCKET ATTACH	
	FRONT BUTTON PLK HEM	BACK YCKE LABEL	
	FRONT KAJA PLK HEM	BACK YCKE T/S	BACKS
	FRONT PLACKET FUSING	BACK YCKE ATTACH	

Figure - 3: Progressive Bundle Systems

The progressive bundle system is somewhat cumbersome in operation and requires large quantities of work in progress. However, it is probably one of the most stable systems if large output is required. The only disadvantage of this system is that production gets badly affected if there is serious absenteeism or prolonged special machine breakdowns.

1.2.2 Unit Production System (UPS)

A unit production system (UPS) is a type of assembly line layout that uses an overhead transportation system to move garment components from one work station to another for assembling the garment. All the parts for a single garment are moved forward through the production line by means of a hanging carrier that travels along an overhead conveyor. At the completion of an operation the operator presses a button, and the carrier moves on to the next operation. Most unit production systems are linked to a computer control centre that routes and tracks production and provides up-to-the-minute data for management decisions. Proper planning is required to make this system effective.

The unit production system transports all the pieces of one complete product through the manufacturing process. The carrier takes all the pieces of one entire unit (i.e., for trousers - backs, fronts, pockets, etc) through the different steps of production. Operations are performed at individual workstations. The end result is a cost-efficient product, processed from pieces to completion.

The essential features of this type of system are:

- The unit of production is a single garment and not bundles.
- The garment components are automatically transported from workstation to work station according to a pre-determined sequence.
- The completed product arrives to an unloading station.
- The empty product carrier returns to the loading station.

Unit Production System requires substantial investments, which may not always be justified by conventional payback calculations. However, UPS has many intangible benefits such as a more orderly and controlled flow of work, and the ability via the control computer of simulating the production situation some time in advance. This system provides a clothing factory with the capability to respond quickly to any changes, which might occur.

1.2.3 Modular Production System (MPS)

This system focuses on a **team method** of assembly. The members of a team are responsible for either the entire garment or a specific operation of the assembly process, depending on the overall production plant and the number of components to be put together.

The team is trained on the functions requires and paid as a team, based on the total

output. The team members operate individual machines and do separate tasks, but they work together for their final compensation. They are also **cross trained** to help company avoid any kind of production lapses.

MPS is efficient garment assembly system as it reduces production time and improves quality. Since workers get to do different tasks, there is cut down on work monotony and job performance is enhanced.

EXERCISE

Visit a garment production facility and identify the production system followed there. Write a short report on the process undertaken there to manufacture the garments. The report should include the following information:

- The product under the manufacturing
- Number of sewing machines and operators
- Total production output per day
- Advantages and disadvantages of the production system faced by the management.

Fill in the blanks:

1. The choice of best assembly system depends on the _____, _____ and _____of the company.
2. In the _____ System the operators specialise in one major component and sew it from beginning to end.
3. In a Unit Production System (UPS) all the parts for a single garment are moved forward through the production line by means of a _____ that travels along an_____.
4. _____ System requires substantial investments.
5. Modular Production System focuses on a _____.