

SILK THROWING

Throwing means twisting before weaving through series of operations.

The term THROW means to twist or spin

There are two types of yarns used in the weaving sector - one is raw silk yarn i.e., reeled silk directly from cocoons.

Second one is spun silk yarn - this yarn is produced out of silk waste.

For both the above types of yarns throwing process is necessary before weaving

Objectives of throwing:

① Generally reeled silk yarn or spun silk yarn is available in the form of hank. So before weaving this should be wound onto a convenient form of bobbins or cheese or cone i.e. winding from hank into bobbin or cone or cheese form

② By winding process some of the defects such as loose ends, long knots, gum spots etc., will be avoided.

Processes in silk throwing

There are four main processes in this operation they are

- ① Winding

- ② Doubling

- ③ Twisting and

- ④ Re-winding.

Winding: Winding is necessary to rewind silk yarn ^{from hank} ~~form~~ into bobbins. Normally double flaged bobbins are used on this winding machine. Winding machine generally consists of 50 or 100 units, and it is double sided. on each side there is a creel (Shift holder) either below or above the bobbin. ~~Sometimes~~ silk hank is mounted on shift which is weighed by means of a dead weight to keep it under sufficient

tension so that thread is not pulled loosely during winding. Double flaged bobbin is mounted horizontally and driven by surface contact by the disc mounted on a long shaft. So winding rate is constant throughout the winding period. During this winding process hard gum spots, loose ends and defective knots etc are removed so the quality of silk thread in the bobbin is comparatively better than that on the hank. Normally before winding the hanks are soaked in mild soap and oil solution (0.5% soap and 2% coconut oil) so as to wet/soften the hank for smooth unwinding. This solution is prepared in tepid water. Hanks are immersed ^{from} ~~for~~ few hours ~~to~~ to one day. After semi drying the silk winding takes place. Winding is done under standard atmospheric conditions of $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and $65\% \pm 2\% \text{RH}$. If breaks are less during winding it indicates that the quality of silk is good. So winding process Preliminarily indicates the weaving efficiency and quality of fabric. Winding speed varies depending upon the denier of raw silk. Generally for finer raw silk winding

Soaking

Coconut oil is used as it makes the fabric soft & temporary coloring.
The temporary coloring is done for identifying the warps and the wefts.

Silk hanks should be soaked in mild soap and oil solution

i.e., 0.5% soap & 2 % coconut oil

Followed by semidrying under shade



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Semidrying under shade

Winding



1. Mounting of Hank on the reel



3. Knotting



4. Winding under progress



2. Winding under constant pressure



5. Factory View

Weight

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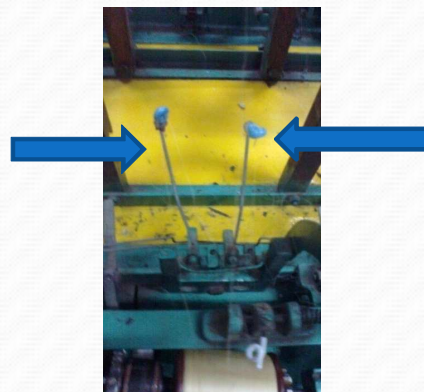
Doubling :

The object of doubling is to double the individual threads. Doubling avoids unevenness and strength of doubled yarn is correspondingly better than the single thread. Doubling takes place in two ply, three ply, four ply or even more depending upon the nature of fabric is required. Doubling machine is more or less like winding machine. Bobbins produced on winding machine are placed on the creel on the

ground and number of threads are doubled together passing through thread guide and individual thread stop motion device and then on to the bobbins which are mounted horizontally and driven by surface contact. If any individual thread breaks the particular bobbin unit stops automatically in order to avoid singles. There is a pin through which the individual thread is passed before it is wound on to a bobbin and when there is a break tension on the pin is lost on account of the absence of thread. So the pin drops down and comes in the way of a continuously rotating drum, which ultimately stops the particular bobbin. This machine is also has capacity of 50 or 100 bobbins and it is double sided.

Doubling

The process where filaments or threads from two/three or more bobbins are wound together is called **doubling**.



Doubling Machine with thread sensors stops the machine when any one thread breaks

Twisting:

Twisting machine is different in look and principle as compared to winding and doubling machines. There is a vertical spindle on which bobbin is mounted and yarn from this is wound on to a perforated bobbin which is mounted horizontally and driven by surface contact. Twist is imparted on account of difference between the speed of the spindle and the winding drum. This machine has normally two or three rows of spindles in order to save the spacing. It is also double sided. There is a device to change the twist rate i.e. by increasing or decreasing the drum speed with reference to the spindle speed.

Heat setting of the twists is required in order to set the twist on the thread so that distribution of twist on the yarn is uniform. Generally these bobbins are placed in the steam chamber wherein steam is allowed under certain pressure.

Twisting



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Heat Setting

Required in order to set the twist on the thread so that distribution of twist on the yarn is uniform.



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so that steam passes through the layers of yarns on account of perforated bobbins.

Generally for plain cloth two ply warp is used with 18 to 20 t.p.i (twist per inch) in 'Z' way and 3 ply weft with 12-15 t.p.i in 'S' way. For crapes and georgette 40-100 t.p.i are required.

Twisted Silk Filament After and Before Steam Setting



Rewinding : Rewinding machine is like winding machine and it is also double sided. Bobbins produced on twisting machine are placed on top of the machine and the thread is re-wound on to the double flanged bobbins or cheeses ~~or~~ which are driven by surface contact

Waste produced during throwing is 1 to 2%. There are about 1,50,000 throwing spindles in silk industry in India.

Rewinding



Rewinding machine