Warping

Q. What is warping?  
Ans: 
**Warping**: The parallel winding of warp ends from many winding packages (cone or cheese) on to a common package (warp beam) is called warping.

**Objects of warping**: The objects of warping is to convert a predetermined number of single end packages, such as cones or cheeses into a sheet of yarn of specified length & width. The individuals ends in the warp are uniformly spaced across its full width. The warp yarns comprise one of the systems of yarns required to produce a woven fabric & also for warp knitting. The objective at warpⁿ, as erroneously considered by many is not at all to remove yarn faults, the breaks due to these being only incidental.

**Importance of warpⁿ**:  
- Constructions of beam warp yarn.  
- Constructions of a parallel yarn sheet.  
- Modifying the faults of yarn like thick & thin places, large knots etc.  
- Winding the predetermined length of yarn.  
- Combination of small packages.  
- Finding long length of warp yarn.  
- Accelerating the next process.

Q. Why it is essential in weaving? 
Q. Write the objectives of warping. 
Ans: 
Dhaka Textile-'05. Noakhali Textile-'08.

Q. What is the important requirements of warping? 
Ans: 
1. The tension of all wound ends must be uniform & possibly constant during all the time of withdrawal from supply package.  
2. Warp yarn should not impair the physical & mechanical properties of yarn.  
3. The tension should be moderate to allow the yarn complete retain its elastic property.  
4. Predetermined length of warping should be observed.  
5. The production rate of warp yarn should be high.  
6. The surface of warp yarn package must be cylindrical.

Q. Classify warping methods. Write down the utilities/features of sectional warping and High speed warping.
Ans: 
Dhaka Textile-'04,,07. Noakhali Textile-'08.

**Types of warp yarn:**  
1. Selectional warping of pattern warpⁿ.  
2. High speed or beam or direct warpⁿ.

**Feature or utilities of sectional warpⁿ**:
- To produce fancy fabric (stripe or check).
- Hand weaving used in sectional warpⁿ.

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To produce weavers beam from small amount of warp yarn.
To produce weavers beam from yarns which do not required any sizing mtl to be applied before weaving.
To produce weavers beam from twist yarn.
Weavers beam can be formed immediately after sectional warp yarn.
Production is less, so it is costly process.
A tapered beam or drum is used.
Yarn tension can not be kept uniform.
Creel capacity is 300-400.

**Features or utilities of High speed warp yarn:**
- To produce common fabrics in large quantities.
- To produce weavers beam from single yarn.
- For high speed production.
- The weavers beam is produced after sizing.
- A simple flanged bobbin is used as beam.
- To produce weavers beam from large amount of yarn.
- Creel capacity is greater than 12000.
- Cheap process.

Q. Discuss the mechanical thread stop motion in warping with sketch.

**Ans :**
The mechanical device most extensively used for thread stop motion on a beam warper is known as “Singleton” automatic thread stop motion. The working of this device is based on the falling of a bent wire between the nips of a pair of revolving rollers & therby effecting a forward movement of one of these rollers, which throws the driving clutch out of gear through a lever arrangement.

In figure one of the rollers which is mounted on a fixed bearing receives its motion from the winding drum through shafts & levers. This roller through a gear drive at the other end drives another roller which is mounted on a movable bearing & hence can make lateral movements. On one end of this movable roller is a lever fulcrummed at a point above the roller. The lower end of this lever is in loose contact with balance weight by means of lever arrangement. Normally the trigger is supported on a projection. Now when a yarn breaks, the supported on it falls between the two moving rollers. The direction of the rotation of the rollers is such that the pin is dragged down bet" the two & in the process the movable roller is pushed forward. Along with this, the lever also moves
forward & its movement of the lever throws the trigger out from its support. This causes the friction clutch on the driving shaft to be thrown out of gear, simultaneously putting the drum break into action so that the machine is stopped immediately. The balance weight which is attached to the lower part of the trigger assists in the performance of the above operation.

Q. Describe the problems in warp yarn & how can you solve these problems?  

<table>
<thead>
<tr>
<th>Q. Describe the problems in warp yarn &amp; how can you solve these problems?</th>
<th>Dhaka Textile-‘03,’05,’06. Noakhali Textile-’08.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ans:</strong></td>
<td></td>
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<tr>
<td><strong>1. Warp off centre of the beam:</strong> Due to not carefully placing of creel wraith &amp; flanged beam. <strong>Remedy:</strong> Beam &amp; wraith placed properly.</td>
<td></td>
</tr>
</tbody>
</table>
| **2. Ridgy or uneven warp beam:** This defect due to  
(a) Winding of small no. of ends on larger beam.  
(b) When the dents are bent or the spacing between dents are uneven.  
(c) Mixed count. **Remedy:** Higher no of ends be used. | |
| **3. Crossed ends:** Due to  
(a) Faulty knotting after yarn breakage.  
(b) Tying of broken ends.  
(c) Loose warp. **Remedy:** Knotting & tension controlled. | |
| **4. Snarl formation in the warp:** Due to | |

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(a) Over tension.
(b) Improper twist
(c) Position of guide.
**Remedy:** By proper tension & twist.

5. **Missing ends:** Due to
   (a) Faulty stop device.
   (b) Exhausted cone or bobbin
   (c) Absence of cone or bobbin on creel.
   **Remedy:** By correct stop device used.

6. **Hard beam:** Due to high tension.
   **Remedy:** By correct stop device used.

7. **Unequal length of warp:** Due to faulty measuring device.
   **Remedy:** Tension & pressure maintained.

8. **Broken ends:**
   **Remedy:** To be joined carefully the yarn.

10. Large knot.
11. Sandy warping.
12. Slack ends.
13. Uneven tension of warp.
14. Uneven shape of beam.
15. Wild yarn.
17. Warp ends round the creel peg.
18. Unequal length of warp.
19. Unequal size or weight of cone or cheese in the creel.
20. Lapped ends.
22. Soft end on the warping beam.
23. Warp ends round the creel peg (spindle) & result broke.

Q. Compare between High speed warping & Sectional warping.

Dhaka Textile-’05. Noakhali Textile-’09.

**Ans:**

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>High speed warping</th>
<th>Sectional warping</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>To produce common fabric (colour &amp; grey fabric.)</td>
<td>To produce fancy fabric.</td>
</tr>
<tr>
<td>2.</td>
<td>High prod(^a)</td>
<td>Lower prod(^a)</td>
</tr>
<tr>
<td>3.</td>
<td>Large amount of yarn req(^d).</td>
<td>Small amount of yarn req(^d).</td>
</tr>
<tr>
<td>4.</td>
<td>Weavers beam is produced after sizing.</td>
<td>Weavers beam is produced after warping.</td>
</tr>
<tr>
<td>5.</td>
<td>Creel capacity is greater than 12000.</td>
<td>Creel capacity is 300-400.</td>
</tr>
<tr>
<td>6.</td>
<td>Flanged bobbin is used as beam.</td>
<td>Tapered beam or drum is used as beam.</td>
</tr>
<tr>
<td>7.</td>
<td>Single yarn is used.</td>
<td>Twist yarn is used.</td>
</tr>
</tbody>
</table>
10. Used very much. | Not used.

**Q. Define Creel capacity.**

**Ans:**
The amount of package which is contained in creel is called creel capacity.
In sectional warping creel capacity is 300-400. In high speed warping creel capacity is 12000.

**Q. Discuss the measuring & self-stop motion in warping with sketch.**

**Ans:**
This motion is provided essentially to get equal length of warp on all the warper beams of a set. The measuring motions can be independent of self-stopping motion & are of various types. The length wound on to the beam can either be recorded through a measuring roller which is driven by the running yarn or through the winding drum itself.

One of the devices for self-stopping is described below:

The measuring roller (1) at one end has a worm (2) which drives worm wheel (3). On the shaft of the worm wheel there is a worm (4) which transmits the motion to a warp wheel (5). There is a stepped disc (6) on the shaft of the warp wheel. Bent end of a fulcrummed level (7) rests on this disc, while the other end of this lever is attached to an upright trigger (10). At the start the bent end of the lever rests on the depressed point of the stepped disc. When the warp wheel completes on revolution the bent lever falls abruptly in the slot of the disc causing the trigger at the other end of the lever to be throw out of its supports. This causes the m/c to be stopped by throwing the friction clutch on the driving shaft out of gear or shifting the driving belt to wose pulley. Simultaneously brake is also applied to stop the m/c immediately. The length of the yarn wound on the beam...
corresponds to one complete revolution of the wrap wheel. This length can be varied by changing the number of teeth of the worm wheel (3) & the wrap wheel (5).

Q. Describe the functions of components of creel and head stock that are used in warping m/c.

Ans :

**Function of components of creel:**
1. Cone or cheese spindle of high speed & peg for sectional warping.
2. Thread guide: To pass through the yarn in the req'd way.
3. Tensioner: To keep the yarn always in a uniform tension.
4. Yarn cleaner: To remove various faults of yarn like slubs, nepes etc.
5. Suction fan or blower: To remove the dirt & dust from the yarn.
6. Breakage indicator: To indicate breakage in package.
7. Stop device: To stop the m/c when yarn will be broken.

**Features of components of Head stock:**
1. Adjustable or variable v-reed or wraith: To control the width of the warp beam.
2. Measuring & making device: Measure the amount of warp yarn on the beam & marks the yarn.
3. Yarn speed controlling device: To control the speed of yarn.
4. Pneumatic pressure unit: To press the warp beam with the surface contact of driving drum.
5. Break assembly: It stop the m/c after req'd length is wound on beam.
6. Driving drum: Beam is in contact & control with driving drum.
7. Stop motion: Used to stop the m/c after req'd length is wound on beam.
8. Beam bracket: To support & hold the beam.
9. Lease rod: Used for separation of yarn individually.

Q. What is creel?

Ans :
The warps are prepared by placing the individual yarn packages in a large frame which is called creel.
There are mainly two types of creels used for the beam warping m/cs – a) V-creel, & b) Rectangular creel.
V-creel consists of a wooden or metal frame arranged in the shape of a v with its apex in line with the centre of the m/c.
V-creel is mostly used than the rectangular creel.
Mathematical Problems

Q. Calculate the no. of warper beams & the length of warp that can be made from 440 bobbins, each of which contains ½ lb of 60’s cotton. The no. of ends of warp req’d is 2200. Allow 5% waste & yarn left on the bobbins.  

Ans :  
Total wt. of yarn = $440 \times \frac{1}{2} - 5\% = 209$ lbs.  
Length of warp = $\frac{\text{wt. of warp in lb} \times \text{count} \times 840}{\text{no. of ends}}$ yds  
= $\frac{209 \times 60 \times 840}{2200} = 4788$ yds. (Ans)  
No. of beam = $\frac{\text{Total no. of ends}}{\text{No. of bobbins}} = \frac{2200}{440} = 5$ (Ans)  

Q. Calculate the quantity of yarn in lbs which will be req’d for a set of 6 back beams to be produced on a modern high speed beam warper. The length of warp on each beam is 24000 yds & there are 462 ends on each beam count 36’s. Allow $1\frac{1}{2}\%$ or 1.5% for waste during warping.  

Ans :  
Length of warp req’d per beam = $24000 + 1\frac{1}{2}\% = 24360$ yds  
Wt. of yarn in lbs req’d for the set = $\frac{\text{Total length of yarn in yds}}{\text{count} \times 840}$  
Total length of yarn for the set  
= Length of warp in yds req’d per beam $\times$ no. of ends per beam $\times$ no. of beams  
= $24360 \times 462 \times 6$  
= 67525920 yds  
Wt. of yarn in req’d for the set = $\frac{67525920}{36 \times 840} = 2233$ lbs. (Ans)  

Q. Calculate the time req’d to prepare of 8 warpers beam on 2 improved modern high speed beam warpers with warping speed of 560 yds (Calculated) per min. The length of warp on each beam is req’d to be 36,00,000 yds. Efficiency 80%.  

Ans :
Actual production per m/c per hr, (in yds)  
= Calculated production in yds/m/cs/hr × 60 × Effi.  
= 560 × 60 × \frac{80}{100} = 26880 \text{ yds.}  
\text{Time req} = \frac{\text{Total length of warp in yds} \times \text{no. of beams}}{\text{Actual production in yds per m/cs per hr} \times \text{no. of m/cs}}  
= \frac{36000 \times 8}{26880 \times 2} = 5.36 \text{ hrs. (Ans.)}  

Q. Calculate the length of warp that can be produced per day of 8 hrs on an improved high speed beam warper if the warping speed is 610 yds per min. The effi is 75%.  

\text{Ans :}  
Actual production or Actual length of warp production/8hr  
= 610 \times 60 \times \frac{75}{100} \times 8 \text{ yds}  
= 219600 \text{ yds. (Ans.)}  

Q. Calculate the production of a modern high speed beam warping m/c from the following particulars:  
R.P.M. of winding drum = 260  
Diameter of winding drum = 22”  
Efficiency = 80%  
Time = 8 hrs  
Production/8hr = ?  

\text{Ans :}  
Production/8hr = \frac{\pi \times \text{dia of drum} \times \text{r.p.m. of the winding drum} \times \text{hr} \times \text{efficiency}}{36 \times 100}  
= \frac{3.14 \times 22 \times 260 \times 60 \times 8 \times 80}{36 \times 100}  
= 191581.860 \text{ yds. (Ans.)}  

Q. Calculate the production of a modern high speed beam warper m/c from the following particulars: Rpm of winding drum = 260, diameter of winding drum = 22”, no. of ends = 420, time = 8hrs, efficiency = 80%, count = 32, production/8hr in pound?  

\text{Ans :}
Fabric Manufacturing - I

Production = \frac{\pi \times \text{dia. of drum} \times \text{r.p.m. of drum} \times \text{hr} \times \text{efficiency} \times \text{no. of ends}}{36 \times 840 \times \text{count} \times 100}

= \frac{3.14 \times 22 \times 260 \times 60 \times 8 \times 80 \times 420}{36 \times 840 \times 32 \times 100} \text{lb}

= 2993.466 \text{ lb (Ans.)}