Finishing

Introduction

Textile finishing is a term commonly applied to different process that the textile material under go after pretreatment, dyeing or printing for final embellishment to enhance there attractiveness and sale appeal as well as for comfort and usefulness.

Objects of finishing:

The aim of finishing is to render textile goods fit for their purpose or end use. Besides that, finishing can be done for achieving the following purposes-

a) To improve fabric attractiveness.
   - -By modification of fabric appearance (Calendaring, Optical brightening)
   - -By altering fabric handle (Softening, Stiffening)
   - -Control of fabric dimension (Sanforising, Compacting)

b) To improve service ability.
   - -Protection of fabric (Flame proofing, Water proofing)
   - -Improved performance (Water repellency, Raising)
   - -Easy care properties (Resin finish, Crease recovery)

Textile finishing

Textile Finishing is a process used in manufacturing of fiber, fabric, or clothing. In order to impart the required functional properties to the fiber or fabric, it is customary to subject the material to different type of physical and chemical treatments. For example wash and wear finish for a cotton fabric is necessary to make it crease free or wrinkle free. In a similar way, mercerizing, singeing, flame retardant, water repellent, water proof, antistatic finish, peach finish etc. are some of the important finishes applied to textile fabric. Broadly it can be classified into following classes:

i. Mechanical Finishing,

ii. Chemical Finishing.

iii. Enzyme Finishing

FINISHES

What is a Fabric Finish?

- A fabric finish is applied to a fabric once it has been made to improve its appearance, feel or other properties.
- Finishing processes are carried out to improve the natural properties or attractiveness of the fabric and to increase its serviceability.

WHAT FINISHING DO?????

- Provide aesthetic value
- Soften fabric or change the hand
- Adds to durability
- Adds to comfort
- Provide safety
- Improves performance

CLASSIFICATION OF FINSHES

- According to the nature of finishes

1. Chemical finishes
2. Mechhanical finishes

Chemical finishes:-

1. SIMPLE CALENDERING

- It is a high speed, high pressure pressing of fabric (100 yds / min)
- The high pressure flattens the yarn
  - Smoothen the fabric
  - Increases fabric lustre (fabric cover increases and more light is reflected)
  - Used for woven plain or twill weaves
- Over-calendering however is to be avoided
  - Yarns weakened out due to very high pressure
- It is a temporary finish
  - Yarns return to its natural cross section after first laundering

5. Moiré calendering

- The moiré finish produces a wood-grain design on the face size of the fabric
- Moiré finish can be temporary, durable or permanent
  - Cotton or rayon moiré finish is temporary without pretreatment with resin
  - Durable moiré finish requires initial resin treatment followed by calendering
  - Moiré finish on thermoplastic fiber fabrics are permanent if a heated roller is used for calendering
- Methods of producing moiŕe
  - Using engraved cylinder
  - Using smooth calender roller

2. GLAZED CALENDERING

- It is a calendering finish to produce highly glazed / shined polished cotton
- The calender machine used is a friction calender
  - One cylinder of highly polished steel cylinder rotating at speed much higher than the fabric passing through it
- Fabrics are first treated with starches or resins before calendering
  - The spaces between the yarns are thus filled up and glazed appearance is obtained
- Glazed calendering using starch are semi-durable
- Glazed calendering using resins are durable

4. Embossed calendering

- It is a calendering in which a three-dimensional design is created on a fabric
- This is done on a special embossing calender in which the roller cylinder is engraved with the embossing design
- The pattern is then pushed or shaped into the cloth when the fabric passes between the rollers
- Some embossed fabrics are made to imitate more costly woven jacquard or dobby designs

6. Schreiner calendering

- Schreiner calendering produces a low, soft-key lustre on the fabric surface
- Distinct from the high glaze of the glazing calender or the lustre shine of the simple calender
- To produce this effect, one of the steel cylinders of the calender is embossed with fine diagonal lines. These embossing are barely visible in naked eye
- Widely used on cotton & cotton/polyester sateen
- Schreiner calendering may be permanent, durable or temporary finish
  - Is permanent if the fibre is thermoplastic
  - Is durable if the fabric is resin treated but not cured
  - Is temporary if the fibre is non-thermoplastic and not treated with resin

NAPPING

- It is a mechanical finish
- Fibres being raised from woven/knitted fabrics by rotating, bristled, wire covered brushes
- Overall effect is a raised fibres from fabric surface
- Example: cotton flannel, rayon flannel, woollen and worsted napped fabric like kersey, melton
- Napped fabrics have softer handle
- Better insulation properties due to more air entrapment
  - Mainly used as blankets, winter clothing

SHEARING

- A process to used to cut off surface fibers on fabrics
- Uniforms the surface of napped fabrics to provide uniform pile height
- High-speed cutting machine cuts the piles similar to that of a lawn mower
- The blades in the machine are stationary and the fabric moves through the cutting blade

WRINKLE RESISTANCE FINISH

- The ability of the fabric to resist the formation of crease or wrinkle when slightly squeezed is known as 'crease resistance' fabrics
- The ability of a fabric to recover from a definite degree from creasing is called crease recovery
- Finish to reduce the undue wrinkles on fabric or garments
- Cotton, rayon and flax are more susceptible to wrinkle
- Wrinkle occurs due to the hydrogen bonds of the cellulosic molecules in the amorphous region
- Due to application of heat or moisture, the hydrogen bond breaks and new hydrogen bond occurs at new dimension
- Therefore wrinkling can be reduced if the hydrogen bond formation can be reduced

Brushing

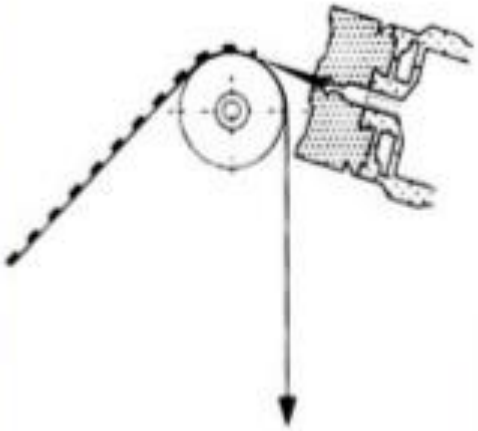
The process which is used to remove loose threads and short fibre ends from smooth-surfaced fabrics and is also used to raise a nap on knits and woven fabrics is called Brushing. Brushing is frequently applied to fabrics after shearing, removing the cut fibres that have fallen into the nap.

ANTISTATIC FINISH

- Synthetic fibres of hydrophobic nature are prone to generation of static charges
- This problem is very troublesome while processing the fabric at high speed in dry state
- Antistatic agents are used
- Antistatic agents absorb small amount of moisture from the atmosphere, thus reducing the dryness of the fabric
- Antistatic finishes are semi-durable
  - Washes out at several launderings or drycleanings
- Permanent antistatic effects are obtainable manufactured fibres which are specially modified for this purpose (Ex: Antron III nylon fibre by Dupont & Cadon nylon fibres by Monsanto)

Singeing

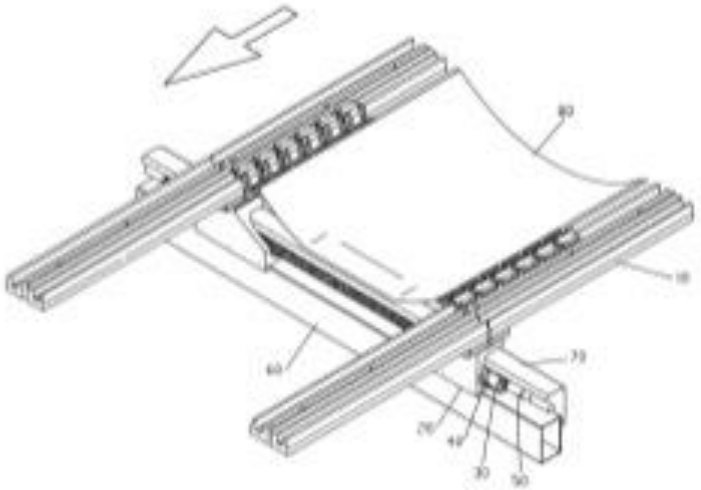
Singeing is a process applied to both yarns and fabrics to produce an even surface by burning off projecting fibres, yarn ends, and fuzz. This is accomplished by passing the fibre or yarn over a gas flame or heated copper plates at a speed sufficient to burn away the protruding material without scorching or burning the yarn or fabric.

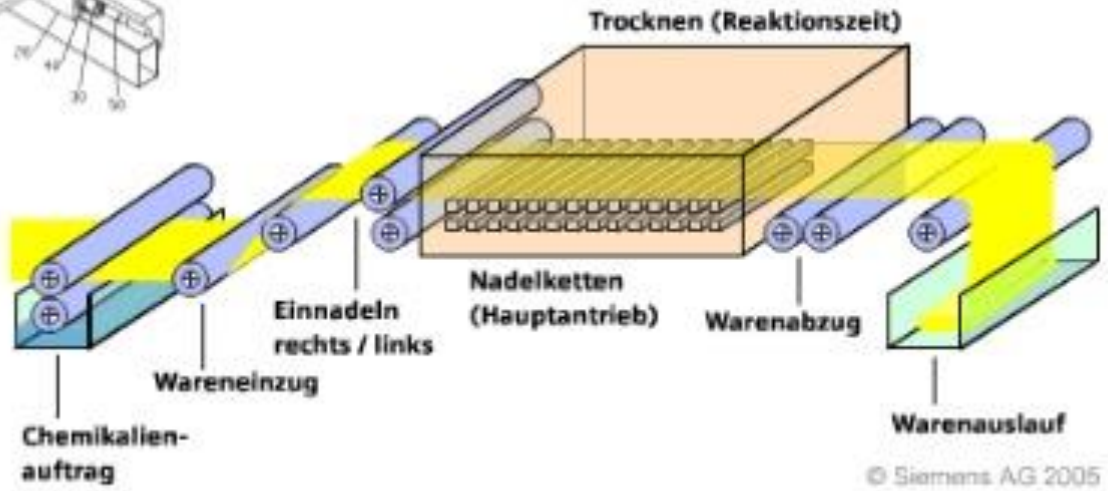


Mechanical Finishing

Tentering,

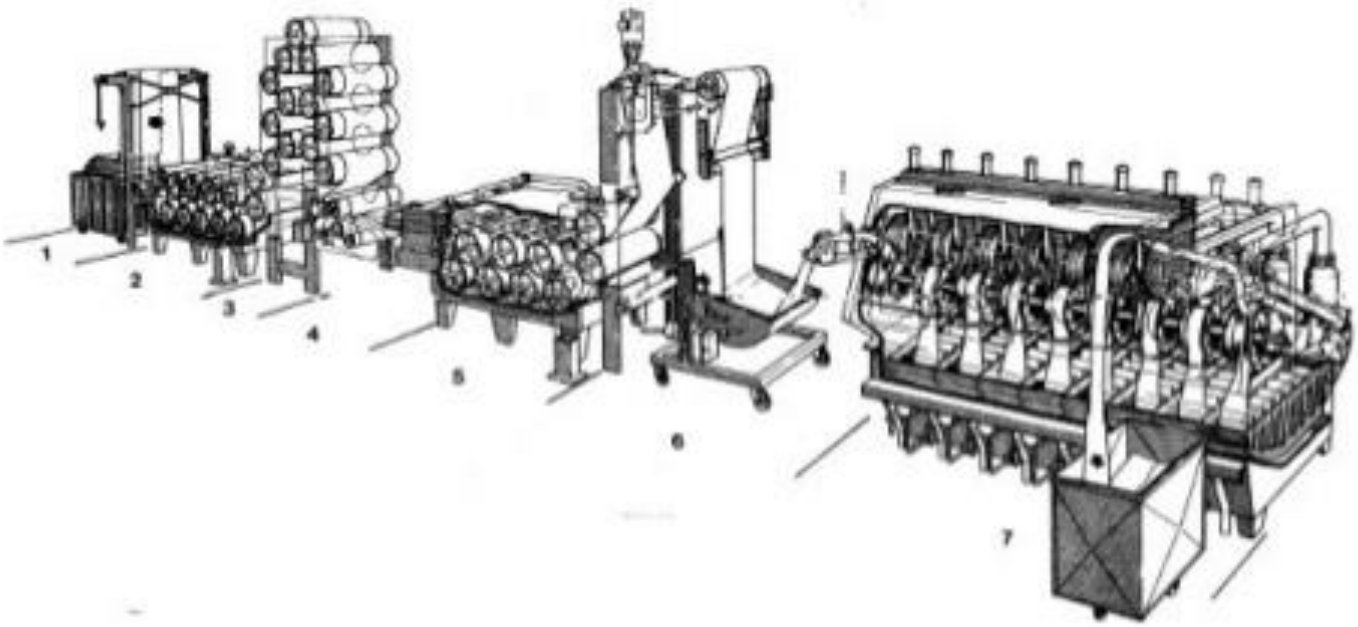
These are final processes applied to set the warp and weft of woven fabrics at right angles to each other, and to stretch and set the fabric to its final dimensions. Tentering stretches width under tension by the use of a tenter frame, consisting of chains fitted with pins or clips to hold the selvages of the fabric, and travelling on tracks.





Mercerization

Mercerization is a treatment for cotton fabric and thread that gives fabric a lustrous appearance. The process is applied to materials like cotton or hemp. Mercerization alters the chemical structure of the cotton fibre. The structure of the fibre changes from alpha-cellulose to beta-cellulose. Mercerizing results in the swelling of the cell wall of the cotton fibre. This causes increases in the surface area and reflectance, and gives the fiber a softer feel.



Fire Resistant finishes:

Polyester fabrics can be made flame resistant by treatment with an aqueous emulsion of xylene soluble 2,3-dibromopropyl phosphate in a pad-cure sequence. A semi-permanent effect can be produced by treating with a mixture of ammonium bromide and brominated phosphoric acid esters.

Anti-microbial finishes:

With the increasing use synthetic fibbers for carpets and other materials in public places, anti-microbial finishes have assumed importance. Anti microbial finish Eco-friendly anti microbial finishing agent for cotton fabrics & Garments. Useful for eliminating bacterial growth due to sweat.

Enzymatic finishes

Bio-polishing**:** This is a process to remove the protruding fibers of a fabric through the action an enzyme. This enzyme selectively acts on the protruding fibers and cease to work after finishing the work by a simple raise in temperature of the treatment bath.

Crease Resistant or Crease Proofing

Crease Resistant Finishes are applied to cellulose fibres (cotton, linen and rayon) that wrinkle easily. Permanent Press fabrics have crease resistant finishes that resist wrinkling and also help to maintain creases and pleats throughout wearing and cleaning.

Soil Release Finishes

These finishes attract water to the surface of fibres during cleaning and help remove soil.

Flame Retardant Treatment

Are applied to combustible fabrics used in children's sleepwear, carpets and curtains and prevent highly flammable textiles from bursting into flame.

Peach finish

Subjecting the fabric (either cotton or its synthetic blends) to emery wheels, makes the surface velvet like. This is a special finish mostly used in garments.

Stain and Soil Resistant Finishes

Prevent soil and stains from being attracted to fabrics. Such finishes may be resistant to oil-boure or water-bourne soil and stains or both. Stain and soil resistant finishes can be applied to fabrics used in clothing and furniture. Scotchgard is a stain and soil resistant finish commonly applied to carpet and furniture.

Oil and Water Proofing

Waterproof Finishes -Allows no water to penetrate, but tend to be uncomfortable because they trap moisture next to the body. Recently, fabrics have been developed that are waterproof, yet are also breathable

Water-Repellent Finishes

Water-repellent finishes resist wetting. If the fabric becomes very wet, water will eventually pass through. Applied to fabrics found in raincoats, all-weather coats, hats, capes, umbrellas and shower curtains.