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REPORT PAPER

THEME: TEXTILE FIBERS

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TEXTILE FIBRES

Cotton is the most important vegetable fiber used in the textile industry. The cotton fiber is a soft substance growing around the cotton seed. When the seeds are ripening, their fibers spring out of the burst boll and are picked manually or mechanically. Having been picked, cotton is mechanically cleaned and separated from the seeds before it is subjected to further treatment. The cotton plant is usually grown as an annual and requires a warm climate.

The leading cotton cultivating countries are the South of the USA, India, Pakistan, the South American countries, Egypt and China. The strength of cotton fibres is relatively high compared with their fineness and it further increases when wet. Cotton fibres are, however, not very elastic, that's why cotton fabrics crease easily. Absorbing moisture well cotton fibres can be easily dyed. As cotton fibres are good conductors of heat, cotton textiles have a cooling effect when worn in hot weather. Cotton fibres are the most important of all vegetable raw materials of textile industry. For example, cotton is used for clothes of all kinds, for shoe uppers, for household textiles and sail clothes which must be very strong though rather thin. Cotton is also used for radio isolation and wire isolation in the industrial electrical world and in many other branches of industry.

Wool is the soft, curly covering which forms the fleecy coat of the sheep and similar animals.

Wool was no doubt the fibre used by man as clothing. It was worn first in the form of a skin or pelt; later the fibers were matted to make a fabric. The next step in its development was the formation of the fibers into yarns from which fabrics were constructed. Today the pelts of sheep are twisted into wool yarns to be woven, or knitted into every type and variety of material.

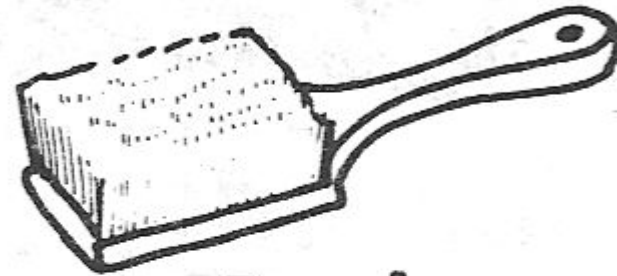
The principal sheep-breeding regions are known to be the Australia, New Zealand, South America, North America and South Africa.

The sheep are sheared to get the wool. The wool fleece to be spun into yarn must be sorted and then washed several times to remove dirt and fat.

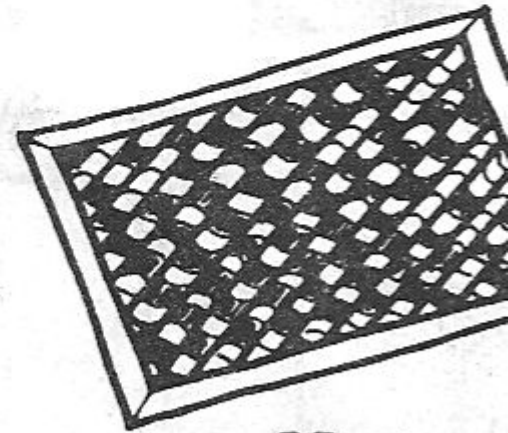
Wool fibres are soft and elastic. Due to the high elasticity of the fibres, wool and textiles hardly crease and retain shape. Wool fibres are sensitive to heat. Therefore, wool and textiles are not to be boiled. The strength of wool fibres appears to be not as great as of flax and cotton.



Palmetto



Brushes



Mats

Cultivated silk is found to be the finest, most elastic and most durable, of all natural textile fibres. The filament of silk is stronger than steel wire of the same diameter and can be considerably stretched without breaking. Its remarkable strength and in comparison with its diameter permit a very strong, light and durable fabric being made. It is especially prized for its brilliant luster, elasticity and beauty.

Silk is produced by the silkworm in spinning cocoon. The worm changes its colour to a semi-transparent pink, and from a hole in its lower lip the silk thread begins to appear. Then by a waving motion of the body the worm gradually envelopes itself in a cocoon of silk which

is drawn out in a double thread slightly twisted and covered by silk gum. Once the silk worm starts spinning it never leaves off until the silk is exhausted. The total length of silk given out is approximately 500 yds.

On enveloping itself in the cocoon and on giving its silk, the worm commences to change from worm to chrysalis, and then to moth. This takes about two or three weeks. After being fully formed, the moth eats its way out of one end, dries its wing in the sun, then flutters about. On leaving its cocoon the moth lays its eggs on a leaf and dies. The eggs hatch into silkworms and the process begins again.

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In breaking its way through the end of the cocoon, the moth cuts the silk thread in thousands of places making it impossible to reel it off. The cocoons are therefore gathered as soon as they have spun and then the insect inside is killed either by steam or by hot air. This must be done very carefully in order to spoil the silk.

The process is known to be a very important one; the silk filaments are reeled of the cocoons into hanks. The cocoons are steeped in hot water to be kept at constant temperature. This softens the silk gum and sets the fibre free. Before reeling the outer covering is brushed away and the end of the silk thread is found. Owing to their great fineness the filaments of six cocoons must be reeled off together.

Fibers or fibres (see spelling differences) are a class of hair-like materials that are continuous filaments or are in discrete elongated pieces, similar to pieces of thread. They can be spun into filaments, thread, or rope. They can be used as a component of composite materials. They can also be matted into sheets to make products such as paper or felt. Fibers are of three types: natural fiber which consists of animal and plant fibres, and man made fibre which consists of synthetic fibres and regenerated fibres. The earliest evidence for humans using fibers is the discovery of wool and dyed flax fibers found in a prehistoric cave in the Republic of Georgia that date back to 36,000 BP.

1 Sources

1.1 Vegetable fibers

1.2 Animal fibers

2 Industrial usage

3 See also

4 References

5 External links

5.1 Classification of natural fibers and list of bats fibers

Natural fibers are made from plant, animal and mineral sources. Natural fibers can be classified according to their origin.

Vegetable fibers

Vegetable fibers are generally composed mainly of cellulose: examples include cotton, jute, flax, ramie, sisal, and hemp. Cellulose fibers serve in the manufacture of paper and cloth. This fiber can be further categorized into the following: CategoryDescription

Seed fiber Fibers collected from seeds or seed cases. e.g. cotton and kapok

Leaf fiber Fibers collected from leaves. e.g. fague, sisal, banana and agave.

Bast fiber Fibers are collected from the skin or bast surrounding the stem of their respective plant. These fibers have higher tensile strength than other fibers. Therefore, these fibers are used for durable yarn, fabric, packaging, and paper. Some examples are flax, jute, knave, industrial hemp, ramie, rattan, and vine fibers.

Skin fiber

Fruit fiber Fibers are collected from the fruit of the plant, e.g. coconut (coir) fiber.

Stalk fiber Fibers are actually the stalks of the plant. E.g. straws of wheat, rice, barley, and other crops including bamboo and grass. Tree wood is also such a fiber.

The most used vegetable fibers are cotton, flax and hemp, although sisal, jute, knave, bamboo and coconut are also widely used.

Hemp fibers are mainly used for ropes and aerofoil's because of their high suppleness and resistance within an aggressive environment. Hemp fibers are, for example, currently used as a seal within the heating and sanitary industries.

Animal fibers generally comprise proteins such as collagen, keratin and fibroin; examples include silk, sinew, wool, catgut, angora, mohair and alpaca.

Animal hair (wool or hairs): Fiber or wool taken from animals or hairy mammals. e.g. sheep's wool, goat hair (cashmere, mohair), alpaca hair, horse hair, etc.

Silk fiber: Fiber secreted by glands (often located near the mouth) of insects during the preparation of cocoons.

Avian fiber: Fibers from birds, e.g. feathers and feather fiber.

economical and technical; natural fibers allow insulation properties higher than current materials.

In life often hear chemical fiber the term, but don't know is what taken literally should belong to chemical that kind of later through chemical dictionaries just know some chemical fiber pollution; Chemical fiber is to use natural or synthetic polymer material as raw material, through chemical or physical method processing and preparation of fiber collectively. For polymer compound, used can be divided into different sources with natural polymer material as the raw fibres and in composite macromolecule substance as raw material of synthetic fiber. Abbreviation chemical fiber.

Use natural or synthetic polymer material as raw material made of fiber. Common textiles, such as sticky tape, polyester khaki, polyamide fiber socks, acrylic yarn and polypropylene carpet etc, are used chemical fiber to be made. According to the different sources of the raw materials, chemical fibre can be divided into: (1) the man-made fibers to natural macromolecular substances (e.g., cellulose, etc.) as raw material, have viscose fiber, etc; (2) synthetic fiber, with synthetic polymer things as raw material, have dacron, etc; (3) inorganic fibers to inorganic as raw material, glass fiber, etc. Since the 18th century drew the first root artificially silk, chemical fiber varieties, since in a fiber method and spinning technology had the very big progress.

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The properties of leather vary considerably depending upon the type and quality of both the skins and the tanning process. Every piece of leather has individual markings which relate to its origins and add character to each skin. Like a fine wine, a good quality leather garment should improve with age. The natural elasticity of each hide means it is flexible and will stretch and return to its original shape. Leather also has a natural tendency to repel liquids and resist staining. It's also fire resistant, and emits no toxic fumes, even when exposed to intense heat. Relative to virtually all man-made textiles, leather is very strong and has a high resistance level to tears and punctures. The comfort provided by most leather goods is due in part to leather's ability to combine breathing and insulating properties. You may have heard... "Leather is hot in summer and cold in winter." In reality, leather adjusts constantly to its environment. Because it is a natural product, leather "breathes" freely, maintaining a comfort level in all seasons.

Before cotton fibre can be used in the making of cloth it must be converted into yarns. This process is called spinning. After ginning the cotton passes this condition it is not possible to clean cotton or use it for manufacture. It must be loosened and separated into small tufts or bunches for further proceedings.

Most cotton contains impurities and dirt, these must be removed before making goods of better quality, opening or loosening the tufts makes possible the removal of the dirt. So, opening and cleaning are generally carried on together. All cottons contain some short fibres. In most cases it is necessary to separate the shorter fibres from the longer ones before making goods of better quality. To give necessary opening and mixing different machines are used such as: bale breaker, blending feeders, vertical and horizontal openers.

Most of the cloth we use is made by weaving. Practically all household fabrics and a large part of clothing materials are woven. Weaving consists essentially of an interlacing of two sets of yarns running in directions at right angles to each other. The threads running lengthwise of the cloth are known as the warp and these running across the warp are called weft or filling.

The set of warp yarns is held firmly in position on a weaving machine called the loom and the other set called the filling, is the weft.

yarns in such a way as to produce a cloth.

Fabric quality depends partly on the structure of the cloth because structure is an important factor in the strength of the fabric and its weaving efficiency.

The method of interlacing the filling and warp is called the weave and may vary to meet different conditions.

There are many hundreds of different types of weaves to meet varying conditions under which the cloth is to serve for use. It is possible to classify all woven fabrics into the following large divisions of weaves:

1. Plain weave and its variations
2. Twill weave and its variations
3. Satin weave and its variations, including figure

weaving

Weaving is an interlacing of two sets of yarns at right angles. It is the principal method of fabric construction. The yarns running lengthwise of the cloth are called the warp yarns. The yarns running across the warp are called the weft yarns (filling yarns). The structure of the cloth is an important factor in the strength of the fabric and its wearing efficiency.

1 plain weave and its variations.

2 twill weave and its variations.

3 satin weave and its variations.

Knitting is a method by which thread or yarn may be turned into cloth or other fine crafts. Knitted fabric consists of consecutive rows of loops, called stitches. As each row progresses, a new loop is pulled through an existing loop. The active stitches are held on a needle until another loop can be passed through them. This process eventually results in a final product, often a garment.

Knitting may be done by hand or by machine. There exist numerous styles and methods of hand knitting.

Different yarns and knitting needles may be used to achieve different end products by giving the final piece a different colour, texture, weight, and/or integrity. Using needles of varying sharpness and thickness as well as different varieties of yarn can also change the effect.

The word is derived from knot, thought to originate from the Dutch verb knutten, which is similar to the Old English cnyttan, to knot..

One of the earliest known examples of knitting was cotton socks with stranded knit color patterns, found in Egypt from the end of the first

millennium AD. Originally a male-only occupation, the first knitting trade guild was started in Paris in 1527. With the invention of the knitting machine, however, knitting "by hand" became a useful but non-essential craft. Similar to quilting, spinning, and needlepoint, knitting became a leisure activity.

Hand-knitting has gone into and out of fashion many times in the last two centuries, and at the turn of the 21st century it is enjoying a revival. According to the industry group Craft Yarn Council of America, the number of women knitters in the United States age 25–35 increased 150% in the two years between 2002 and 2004. The latest incarnation is less about the "make-do and mend" attitude of the 1940s and early 50s and more about making a statement about individuality as well as developing an innate sense of community.

Within the 1940s, English knitting rose in popularity while Continental knitting fell. This is due to the fact that continental knitting originated within Germany and was spread by immigrants. During World War II, continental knitting fell out of style due to its relationship with Germany. It wasn't until Elizabeth Zimmermann publicized continental knitting in the 1980s that it again was popularized.

Knitting is the second of the fundamental methods of making fabrics. Knitting is the interlacing of the continuous yarn in such a way as to form loops which are interlocked to make cloth. The essential element of knitting is the loop. A loop is a very small length of yarn drawn through another loop. The loops are lying side by side in a line across the fabric called "courses". The loops succeeding one another in a line lengthwise of the fabric are called "wales". Knitting fabrics are widely used now.

Cloth as it comes from or other machine is unfinished and therefore it must have special treatment or finishing before it is ready for use. This finishing has definite purposes, the chief one being to add attractiveness to the cloth. Very often however the kind of cloth and its use are determined by the way it is finished.

Whether the cloth shall be made soft or stiff, dull or glossy, and so on, depends upon the finish applied and the materials used. In addition, fabrics are often given treatments that affect the final colouring and absorbency. Many fabrics are bleached. This may be done for the purpose of white fabrics to prepare the fabric for later colouring producing white fabrics or to prepare the fabric for later colouring. Cotton may be mercerized to get additional lustre and absorbency and to produce

clearer, brighter colours. These preparatory treatments are important to the final colour and appearance of the fabric. Synthetics require no pretreatments except possibly bleaching.

The natural colours of textile fibres are seldom uniform and still more rarely pleasing to the eye. Textile workers name fabrics in the natural colour greys. If the natural greys were one uniform shade, they might be useful, but there are yellowish greys, bluish, reddish, greenish, and blackish greys. Uniformity of colour, either plain or patterned, has always been regarded as a necessary quality in cloths. To obtain uniform white, we bleach; for a single and uniform colour we dye; for coloured patterns, we either weave with yarns dyed in different colours, or print.

The most common cloth finishes are: 1. bleaching, 2. mercerizing 3. dyeing 4. printing 5. napping p . wate proofing, etc., the first four being the most important.

Cotton ginning is the process of separating the seeds from the cotton fibres. Cotton ginning includes: drying, cleaning, feeding, ginning and packaging. Cotton fibres according to their length may be divided into three groups: long-stale cotton, middle-stale cotton and short-stale cotton. Seed cotton picked from cotton fields. After picking cotton is delivered to the ginning plants (gins). Gins dry, clean and separate the fibres or lint from the cotton seeds. Today ginning plants clean, dry and gin the cotton mechanically.

Fibre is the most common material in the world .It is the form of all vegetable and most animal substances. Fibres are divided into vegetable fibres (cotton. flax).Fibres of animal origin (wool. silk) and chemical or man-made fibres (capron. nylon).

The first process in making cloth is spinning. Weaving is the principal method of fabric construction. Knitting is the second fundamental method of making fabrics. The chief purpose of finishing is to add attractiveness to the cloth