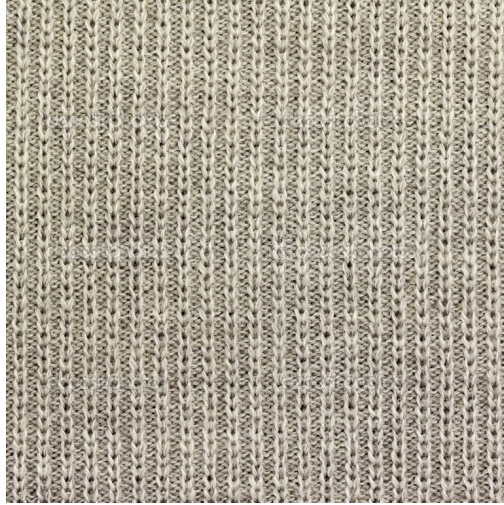
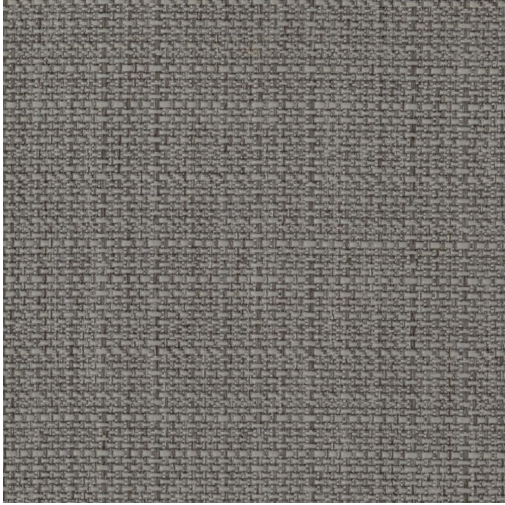


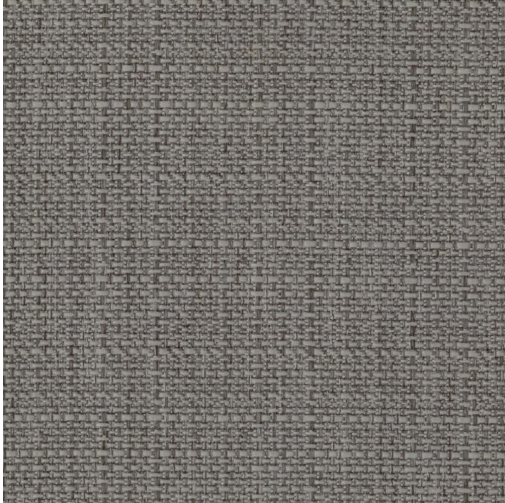


# Felting, Knitting and Crocheting

# Wovens, Knits & Nonwovens



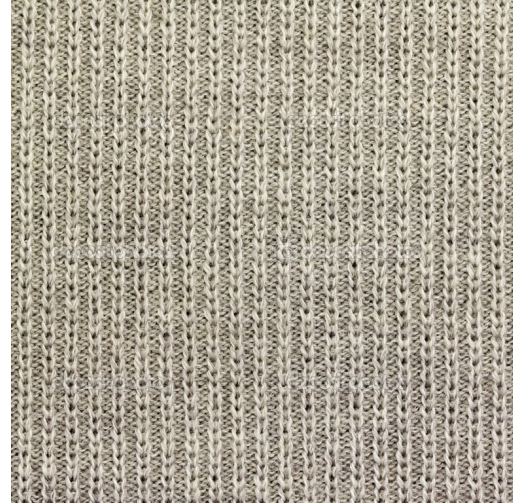
# Wovens



- woven on a loom
- consists of vertical (warp) and horizontal (weft) threads that cross each other
- stretches on the bias (diagonal)

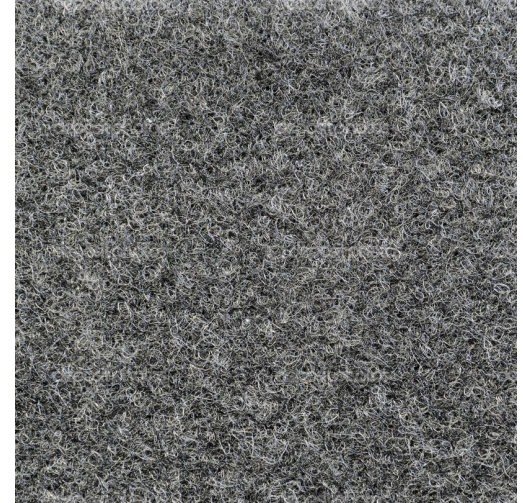
# Knits

- flexible
- can be constructed to size (hats or socks)
- warp knit (machine): lace, lingerie, tricot, hard to unravel
- weft knit : can be unraveled horizontally, cheaper to produce



# Nonwovens

- long strands of fiber that are bonded together via heat, mechanical, chemical, or solvent treatment
- eg: filters, geotextiles, diapers, insulation, medical equipment (surgical gowns)



# The Burn Test

\*make sure you have water close by in a metal container and are in a well-ventilated area\*

- **Cellulose** (cotton, hemp, linen, rayon, bamboo): lights quickly, smell like burnt paper, ash is light grey
- **Protein** (silk, wool, cashmere, alpaca, etc): burns slowly, smell like burnt hair, ash is dark and brittle
- **Synthetics** (nylon, polyester, acrylic): can burn and shrink quickly, may form plastic drip, black smoke

Resource

## Felting



Process of creating objects using bonding fibers.



sheep



angora goats (mohair)



angora rabbit



beaver



## Wet Felting

Using water and soap to create felted objects. [Tutorial](#)



## Felting



making a robe for Bakhitari shepherds (Iran)

- earliest examples found in 6000 BCE, origins primarily in Europe and Asia
- used for insulation and protection



Horse saddle cover, Siberia, 300 BCE

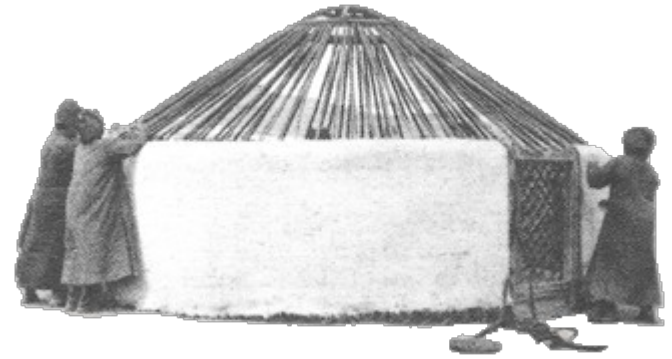
## Felt Makers-Terelj, Mongolia



Felt Makers-Terelj, Mongolia

<https://www.youtube.com/watch?v=J1H2LepsF4I>

Yurts!





<https://www.youtube.com/watch?v=obbh5i8TyCs>



Felting other  
objects!





Russian valenki







Fulling (boiled wool): felting a knitted or woven object after it is made



Fulling of woven cloth à la 10<sup>th</sup> century English methods using human urine

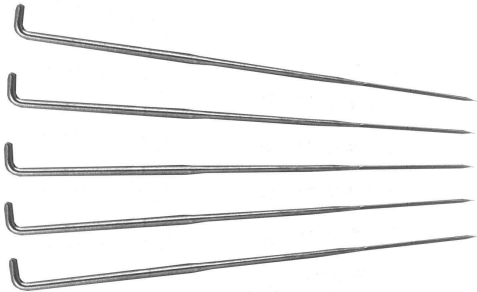


Fulling

<https://www.youtube.com/watch?v=cdJVqPQXG9I>

## Needle Felting

- 19th c. industrial felting machines used rows of sharp barbed needles
- 1980's became tool for home crafting



<https://www.youtube.com/watch?v=sDz5J41-ETo>

<http://www.feltcrafts.com/new-machines.html>





Jule Waibel, industrial felt seats steam folded

Claudy Jongstra







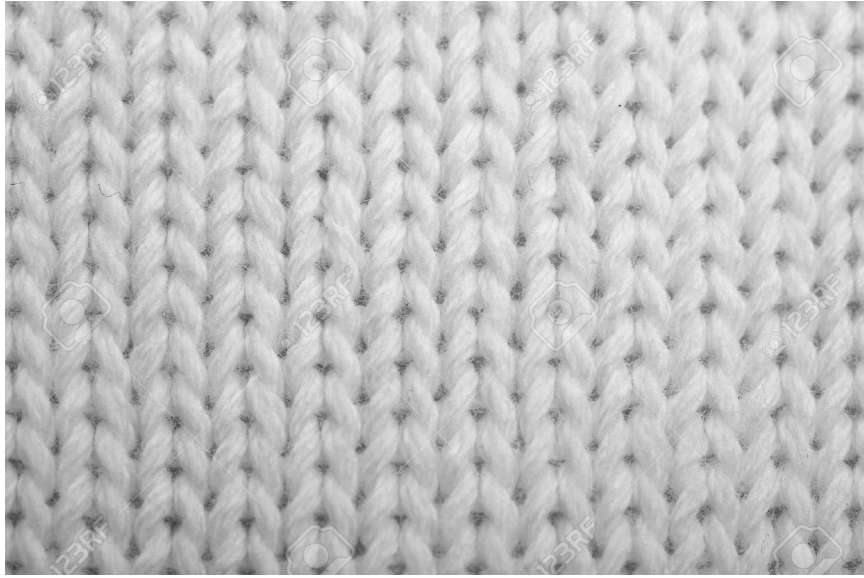




***DEMO:***  
***Wet and Dry***  
***Felting***

# Knit vs. Crochet

Creating interlocking loops using a continuous strand of yarn









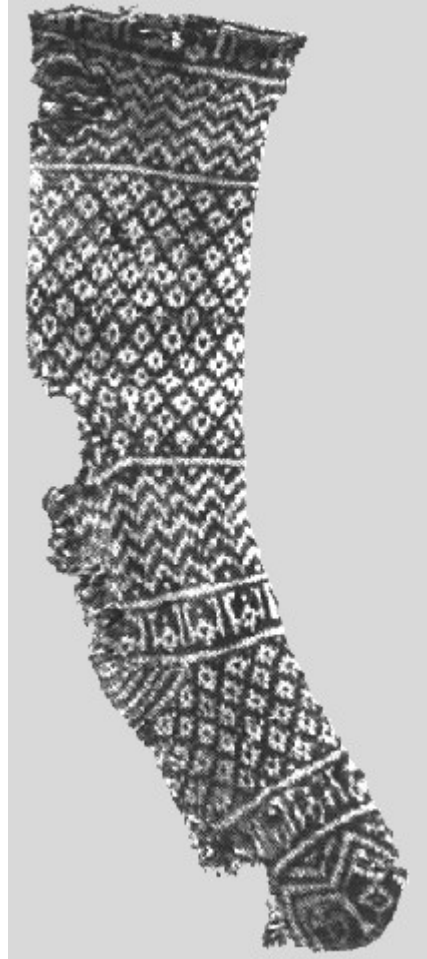
3rd century sock, Egypt using **naalbinding technique** (one needle knitting)



socks, made in Egypt in the fourth or fifth century



Nålebinding still practiced in Peru, Scandinavian countries, Balkans  
<https://www.youtube.com/watch?v=527c5ayqrik>



- ~10th century,  
Egypt
- knitted Khufic  
(Arabic) blessings  
in pattern
- cotton yarn

- 1275, Spain: liturgical gloves
- considered luxury items reserved for royalty or wealthy







- by 1400's, demand rose and knitting guilds and cottage industries established
- knowledge of technique spread

### **Secret History of Knitting**

<http://www.enneacollective.com/history-in-the-making-the-secret-history-of-knitting/>



British sailors, WWI



Estonian socks

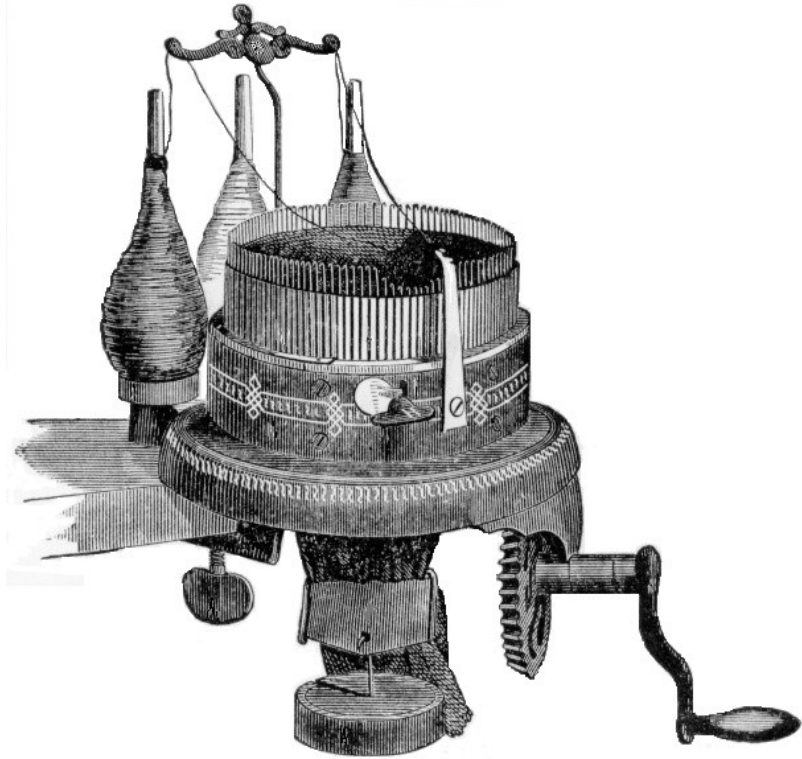
Unraveling for material reuse



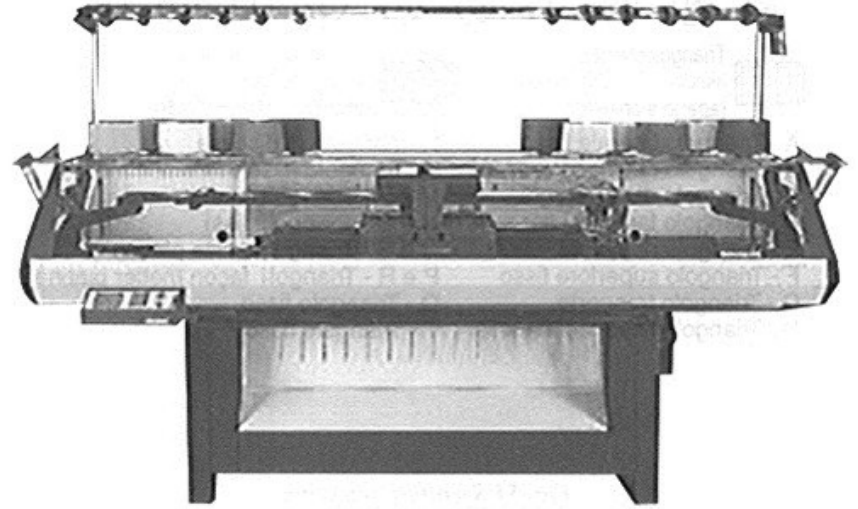
## Stocking Frame

- 1589, Nottingham England:  
William Lee
- imitates handiwork of hand  
knitters





Circular sock machine



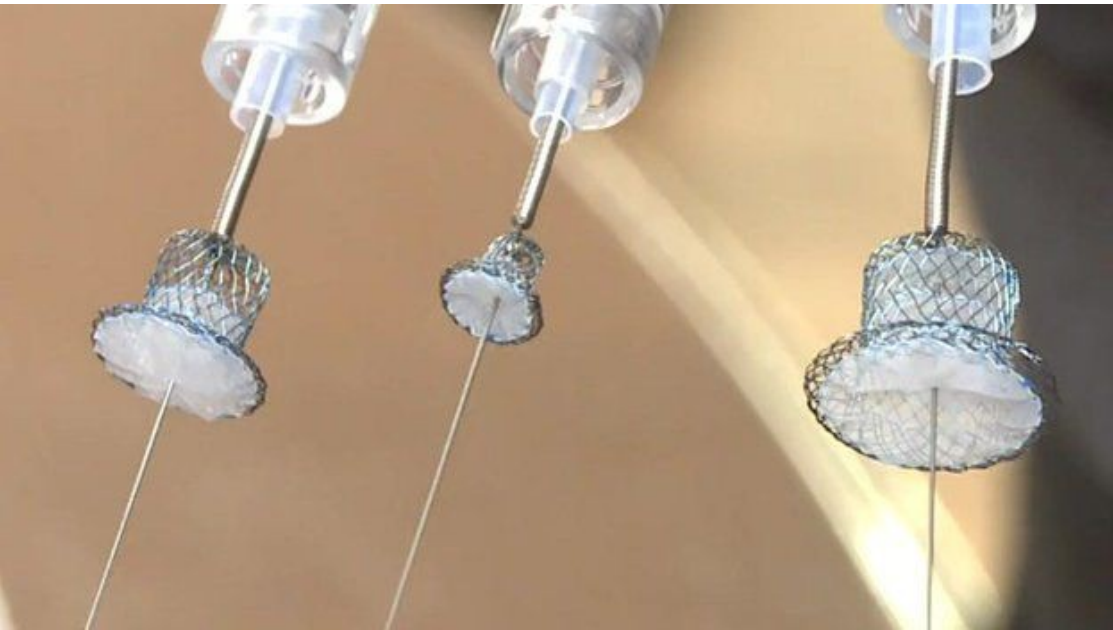
Flatbed knitting machine



<https://www.youtube.com/watch?v=u40IM5V1Zg8>

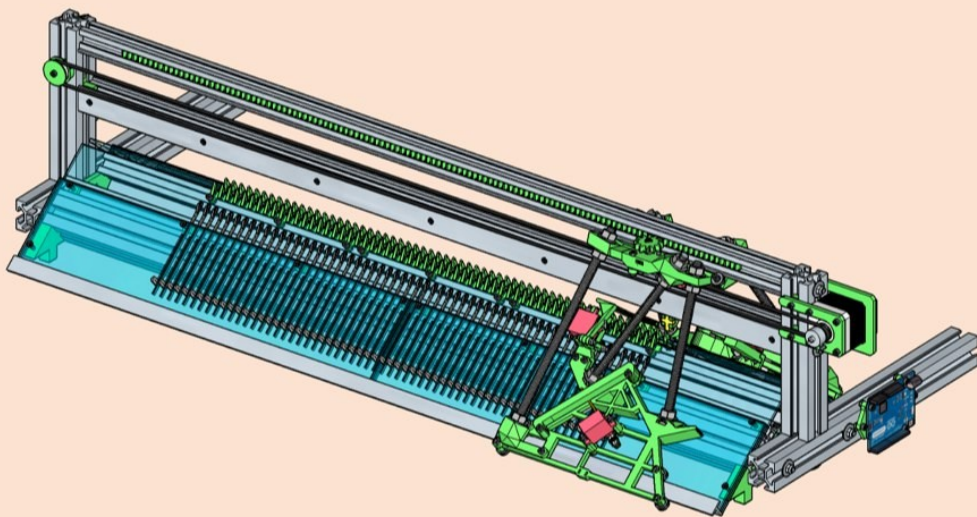
## History of Sock Manufacturing

<https://www.cottonworks.com/topics/sourcing-manufacturing/garment-manufacturing/the-art-of-sock-manufacturing-history-of-sock-manufacturing/>



Bolivian women knitting high tech medical products. Nit Occlud device which was designed by cardiologist Franz Freudenthal and is used to treat heart problems in children. Device remains folded as it travels through blood vessels.

<https://www.youtube.com/watch?v=dHDDQVB2SnE>



## OpenKnit - Gerard Rubio

SOURCE : [OPENKNIT.ORG](http://OPENKNIT.ORG)



<https://makezine.com/2014/02/20/openknit-an-open-source-knitting-machine/>

<https://vimeo.com/86987828>







## Kniterate: the Digital Knitting Machine

~~\$7,699.00~~ \$7,499.00

Until February 19, 2019

*(Only 45 available for 18 more days)*

<https://www.kniterate.com/product/kniterate-the-digital-knitting-machine/>

**Crochet** origins are unknown, although it is speculated that it most likely developed from Chinese needlework referred to as tambouring, which reached Europe around 1700.



re-creation of first  
crochet pattern from 1823



19th century crocheted lace developed in Ireland as substitute to expensive true lace. Irish lace was taught widely as famine relief. 12,000 women were working in crochet by 1857 in Ireland.



Queen Victoria crocheting



One of eight scarves Queen Victoria crocheted for presentation to members of her forces fighting in South Africa. This is the scarf awarded to Private R.R. Thompson on display at the Canadian War Museum.



Felieke van der Leest



