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Looms and Textiles - Key Insights

EXPERT's Column

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This article explains the relevance and importance of the loom in textile. The salient points of looms, their components and their types, special attachments for smooth functioning, development of looms with incremental efficiency; types of handlooms and their transition resulting in the evolution of powerlooms. Presently advanced techniques and versions have stormed into the textile world covering the diverse fibre economy the world over.

The key component of textile fabric manufacturing is a loom. There are different types of looms viz., manually operated and automation looms. The different components of a loom are important for the creation of a fabric. Efficiency of a loom is vital for perfecting the product. The speed varies with performance of the components. Handlooms take more time while automation enhances speed and perfection.

The evolution of looms across regions is need based, availability of skills and culture dependent. India has a rich textile heritage since ages. The region-specific skills have led to diversified creation of textile products imbibing specific art and design.

Etymology of a Loom

The word 'loom' is derived from the old English word 'geloma'; formed from ge- (perfective - prefix) and 'loma ' a root of unknown origin. The whole word geloma meant an utensil, tool or a machine of any kind. In 1404 'lome ' was known as a machine which wove a thread into

a cloth. In 1838, the word ' loom 'acquired an additional meaning of interlacing of threads.

What is a Loom?

A loom is a device used to weave a cloth or tapestry. The basic purpose of any loom is to hold warp threads under tension. The precise shape of the loom and its mechanics may vary but the basic function is the same.

Components of a Loom and Their Functions:

The components of a loom have their own specific role.

Basic Structure:

Weaving is done with two sets of threads or yarns inter-crossing each other. The warp threads (horizontal) are stretched on the loom. Each weft thread (vertical) is inserted, so that it passes over and under the warp threads.

The warp thread ends are fastened to the beam. One end is attached to one beam and the second one to the other, so that the threads lie parallel and are of the same length and are held tight.

The cloth is woven starting with one end of the warp thread progressing to the other end. The beam at the finished fabric end is the cloth beam, while the other end is the called the warp beam. Beams may be used as rollers by the weavers to weave a cloth longer than the loom. As the cloth is woven, the cloth is unrolled from the warp beam to the cloth beam. As the cloth is woven, the warp threads are unrolled from the warp beam and the portion of the cloth formed is rolled on the cloth beam. This is called as the take-off roll. The cloth which is not entered as take-off roll is called the fell.

Not all looms have two beams. For example, the warp- weighted loom has one beam. The warp yarns hang from the beam. The bottom ends of the warp beam are loosely attached to dangling weights.

The loom has to perform three important functions - shedding, picking and battening.

Shedding: This is the process of pulling off the warp threads to form a shed (space between raised and unraised warp yarns). The space is the portion through which the filling yarn carried by the shuttle is inserted to form the weft.

Shedding may be simple, for example lifting odd threads alternately with even threads to form tabby weave (the two sheds are called shed and counter shed). More intricate shedding sequences would produce complex weave like twill.

Picking: A single crossing of a weft thread from one end to the other end of the loom through the shed is known as a pick. Picking is passing a weft thread through the shed. A new shed is formed before a new pick is inserted. Conventional shuttle looms can operate at speeds of 150 to 160 picks per minute.

Battening: After the pick, the new pass of weft thread is to be tamped against the fell, to avoid forming a fabric with large irregular gaps between the weft threads. This compression of weft threads is known as battening.

There are usually two secondary functions, because the newly constructed fabric should be woven on the cloth beam. This is known as taking up process. At the same time, the warp yarns have to be let off or released to unwind from the warp beam. On an automatic loom there is a tertiary motion - the stop filling motion. This will stop the loom if the warp threads break. The automatic loom requires 0.125 HP to 0.5 HP to operate.

Components:

A loom usually requires two beams to hold the threads apart. It also requires additional components to carry on the processes of shedding, battening and picking in a better and faster way. There are also often components for taking the fell.

The nature of the loom frame and the shedding, picking and battening devices vary. Looms come in different specialised types for special weaving. They are also specialised to cater to different life styles of weavers. The nomadic tribes use looms which are lighter, while the people living in cramped dwellings use upright looms or looms which can be folded in narrow space when not in use.

Frame:

Frames may be oriented by the warp threads into horizontal and vertical looms. Most handloom frame designs can be constructed simply.

Backstrap Loom

Backstrap loom is a simple loom which has its ancient roots, i still used in many cultures around the world (e.g Andean culture). It consists of two sticks or bars between which warp threads are stretched. On bar is attached to a fixed object and the other attached to a strap at the back of the weaver. The weaver leans to give tension to the loom.

Both simple and complex textiles can be woven in backstrap looms. They produce narrow cloth, width equal to the weaver's arm length. They can also produce warp- based textiles decorated with intricate decorative pick-up patterns, supplementary and complementary warp techniques and brocades. Balanced weaves can also be woven in backstrap loom.

Warp Weighted Loom

This is an ancient vertical loom which may have originated in the Neolithic period. Its characteristic feature is hanging weights (loom weights) wherein the warp threads are tightly held. Frequently, additional warp threads are wound round the weights. When the weaver has woven far enough down, the completed section ' fell ' is wound on the top beam and the remaining warp threads are unwound from the weights continue. This helps the weaver in maintaining a constant vertical size. Horizontally, the warp is kept at arm's length Normally two weavers standing side by side at the loom are required for weaving a broad woven cloth.

Simple and complex weaves which require more than two sheds, can be woven on warp weighted loom. They can also be used for tapestries.

Pegged or Floor Loom:

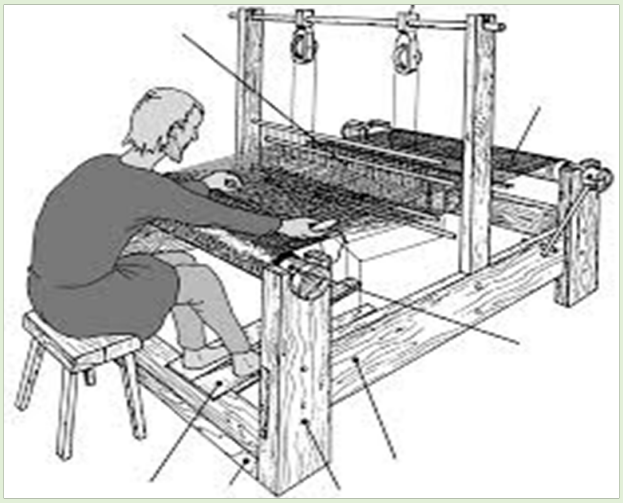
Here beams are kept apart behind pegs driven into ground, with wedges and/or lashings to adjust the tension. Pegged looms may also have horizontal side pieces to keep the beam apart.

Such looms are easy to use, dismantle and transport to different places and are, normally used by nomadic weavers. They are generally used for weaving smaller articles. Urban weavers do not prefer the floor loom because it occupies more space and is unergonomic (not comfortable for the weaver). Hence urban professional weavers are unlikely to use them, as the cheapness and portability of these looms falls short of convenience and comfort.

Treadle Loom

This loom works with a combinatorial action of 17 components which promote key tasks to enable its smooth function. In a treadle loom, shedding is controlled by the feet on treadle.

The earliest evidence of the treadle loom is found on a pottery dish in ancient Egypt, in 4400 BC. The warp threads were woven by treadles on the feet so that the weaver's hands are free to handle the weft yarns.



Pit looms have all the treadles in a pit, which reduces the stress transmitted through the much shorter frame.

In a wooden vertical shaft loom, the heddle is in the shaft. The warp threads pass through the heddles alternately through the heddle, and through the spaces between the heddles (shed) so that raising the shaft raises half the threads and lowering of shaft lowers the thread while the passing of the threads through the spaces between the heddles remain in place.

The treadle loom for figured weaving has a large number of harnesses or control head. For example, it can be attached to a Jacquard machine.

Tapestry Looms:

Although the speed is lower and shedding and picking devices may be simpler, these looms can weave complex weaves with coloured weft threads to create intricate coloured patterns.. Looms used to create tapestry are not called as ' vertical warp-' Or ' horizontal warp ' but ' high warp' and ' low warp (the French terms hautte-lisse and basse - lisse are also used in English).

(....to be continued)

(The views expressed in this column are of the authors and not that of Cotton Association of India)

CAI President Felicitates Union Minister of Textiles

At a textile stakeholders' meeting held at Hotel Trident, Mumbai on July 12, 2024, CAI President Shri. Atul S. Ganatra and CAI Vice President Shri. Bhupendra Singh Rajpal felicitated Shri. Giriraj Singh Ji, Union Minister of Textiles

with Shawl, Coconut and CAI's 100 years' memento.

A number of important cotton related issues were discussed at the meeting, including how to increase cotton yield in the country and removing RCM on cotton.

All India Weather Summary and Forecast
15th July to 24th July, 2024

Significant Weather Features:

Weather Systems

♦ The Monsoon trough is south of its normal position and extends upto lower tropospheric levels. It is likely to be south of its normal position during next 4-5 days.

♦ The off-shore trough runs along south Gujarat-north Kerala coasts at mean sea level.

♦ A cyclonic circulation lies over Gangetic West Bengal & adjoining Jharkhand and Odisha in lower & middle tropospheric levels.

Forecast & Warnings:

West, Central and South Peninsular India

♦ Fairly widespread to widespread light to moderate rainfall accompanied with thunderstorm & lightning very likely over Konkan & Goa, Madhya Maharashtra, Marathwada, Kerala & Mahe, Lakshadweep, Karnataka, Gujarat state, Madhya Pradesh, Vidarbha, Chhattisgarh, Coastal Andhra Pradesh & Yanam; scattered to fairly widespread light to moderate rainfall over Telangana, Rayalaseema; isolated to scattered light to moderate rainfall over Tamil Nadu, Puducherry & Karaikal during next 5 days.

♦ Heavy to very heavy rainfall very likely at isolated/some places over Konkan & Goa, Kerala & Mahe, Coastal & South Interior Karnataka; at isolated places over Madhya Maharashtra, Gujarat state during next 5 days. Isolated extremely heavy rainfall very likely over Konkan & Goa, ghat areas of Madhya Maharashtra on 15th & 16th; Coastal Karnataka and South Interior Karnataka on 15th; Kerala & Mahe on 15th July.

♦ Isolated Heavy rainfall over Telangana, Madhya Pradesh, Vidarbha, Chhattisgarh during 15th-19th; Marathwada, Tamil Nadu, Puducherry & Karaikal, Coastal Andhra Pradesh & Yanam, North Interior Karnataka on 15th & 16th July. Isolated very heavy rainfall likely over Vidarbha, Telangana, Coastal Andhra Pradesh & Yanam, North Interior Karnataka on 15th and Marathwada on 15th July.

East & Northeast India

♦ Fairly widespread to widespread light to moderate rainfall accompanied with thunderstorm, lightning very likely over Andaman & Nicobar Islands, Sub-Himalayan West Bengal & Sikkim and Odisha; scattered to fairly widespread light to moderate rainfall over Northeast India and Gangetic West Bengal and isolated to scattered light to moderate rainfall over Bihar, Jharkhand during next 5 days.

♦ Heavy rainfall very likely at isolated places over Odisha on 15th, 17th & 18th; Arunachal Pradesh during 15th-17th; Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Bihar on 15th; Nagaland, Manipur, Mizoram & Tripura on 15th & 16th July.

Northwest India

♦ Scattered to fairly widespread light to moderate rainfall accompanied with thunderstorm & lightning very likely over Uttarakhand, Uttar Pradesh and West Rajasthan; isolated to scattered rainfall likely over Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh, Punjab, Haryana-Chandigarh-Delhi and East Rajasthan during next 5 days.

♦ Isolated heavy rainfall very likely over Uttarakhand, East Rajasthan during 15th-19th; East Uttar Pradesh on 15th & 18th July.

Meteorological Analysis (Based on 0530 hours IST)

❑ The Monsoon trough at mean sea level now passes through Jaisalmer, Kota, Guna, Sagar, Puri and thence southeastwards to eastcentral Bay of Bengal extending upto 0.9 km above mean sea level.

❑ The Western Disturbance as a trough in middle tropospheric westerlies with its axis at 5.8 km above mean sea level now runs roughly along Long. 72°E to the north of Lat. 30°N.

❑ The off-shore trough at mean sea level along South Gujarat-north Kerala coasts persists.

❑ The cyclonic circulation over Gangetic West Bengal & adjoining Jharkhand & Odisha extending upto 5.8 km above mean sea level tilting southwestwards with height persists.

❑ A cyclonic circulation lies over West Rajasthan & neighbourhood at 0.9 km above mean sea level.

❑ The cyclonic circulation over Nagaland & neighbourhood extending upto 1.5 km above mean sea level has become less marked.

❑ The cyclonic circulation over Gujarat at 5.8 km above mean sea level has become less marked.

Weather Forecast for next 7 days (Upto 0830 hours IST of 22nd July, 2024)

❖ Meteorological sub-division wise detailed 7 days rainfall forecast is given in Table-1.

❖ Thunderstorm accompanied with lightning very likely at isolated places over western Himalayan Region, Central and South Peninsular India during next 4-5 days.

❖ No significant change in maximum temperatures very likely over most parts of the country.

Weather Outlook for subsequent 3 days (During 22nd -24th July, 2024)

❖ Fairly widespread to widespread rainfall likely over most parts of the country except plains of northwest India and East peninsular India where isolated to scattered rainfall likely.

Table-1

7 Days Rainfall Forecast

S. No.	Subdivision	15-Jul	16-Jul	17-Jul	18-Jul	19-Jul	20-Jul	21-Jul
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
1	ANDAMAN & NICOBAR ISLANDS	WS	WS	WS	WS	WS	WS	WS
2	ARUNACHAL PRADESH	FWS	FWS	SCT	SCT	SCT	FWS	FWS
3	ASSAM & MEGHALAYA	FWS	FWS	SCT	SCT	SCT	FWS	FWS
4	NAGALAND, MANIPUR, MIZORAM & TRIPURA	FWS	FWS	SCT	SCT	FWS	FWS	FWS
5	SUB-HIMALAYAN WEST BENGAL & SIKKIM	WS	FWS	FWS	FWS	FWS	FWS	FWS
6	GANGETIC WEST BENGAL	SCT	SCT	ISOL	ISOL	SCT	SCT	SCT
7	ODISHA	FWS	SCT	SCT	FWS	FWS	FWS	FWS
8	JHARKHAND	SCT	SCT	ISOL	ISOL	SCT	SCT	SCT
9	BIHAR	SCT	ISOL	ISOL	ISOL	SCT	SCT	SCT
10	EAST UTTAR PRADESH	SCT	SCT	SCT	SCT	FWS	FWS	FWS
11	WEST UTTAR PRADESH	SCT	SCT	SCT	FWS	FWS	FWS	FWS
12	UTTARAKHAND	FWS	FWS	FWS	FWS	FWS	FWS	FWS
13	HARYANA CHANDIGARH & DELHI	ISOL	SCT	SCT	SCT	ISOL	ISOL	ISOL
14	PUNJAB	ISOL	ISOL	FWS	SCT	ISOL	ISOL	ISOL
15	HIMACHAL PRADESH	ISOL	SCT	SCT	FWS	SCT	SCT	SCT
16	JAMMU & KASHMIR AND LADAKH	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL	ISOL
17	WEST RAJASTHAN	SCT	SCT	FWS	FWS	FWS	SCT	SCT
18	EAST RAJASTHAN	ISOL	ISOL	SCT	SCT	SCT	ISOL	ISOL
19	WEST MADHYA PRADESH	FWS	FWS	WS	WS	WS	WS	WS
20	EAST MADHYA PRADESH	FWS	FWS	WS	WS	WS	WS	WS
21	GUJARAT REGION	WS	WS	WS	WS	WS	WS	WS
22	SAURASHTRA & KUTCH	WS	WS	WS	WS	WS	WS	WS
23	KONKAN & GOA	WS	WS	WS	WS	WS	WS	WS
24	MADHYA MAHARASHTRA	WS	WS	FWS	FWS	FWS	FWS	FWS
25	MARATHAWADA	WS	WS	FWS	SCT	SCT	FWS	FWS
26	VIDARBHA	WS	WS	WS	WS	WS	WS	WS
27	CHHATTISGARH	FWS	FWS	WS	WS	WS	WS	WS
28	COASTAL ANDHRA PRADESH & YANAM	WS	FWS	FWS	SCT	FWS	FWS	FWS
29	TELANGANA	FWS	FWS	SCT	SCT	SCT	FWS	FWS
30	RAYALASEEMA	WS	FWS	FWS	SCT	SCT	SCT	SCT
31	TAMILNADU PUDUCHERRY & KARAIKAL	SCT	SCT	ISOL	ISOL	ISOL	ISOL	ISOL
32	COASTAL KARNATAKA	WS	WS	WS	WS	WS	WS	WS
33	NORTH INTERIOR KARNATAKA	WS	WS	WS	FWS	FWS	FWS	FWS
34	SOUTH INTERIOR KARNATAKA	WS	WS	WS	WS	FWS	SCT	SCT
35	KERALA & MAHE	WS	WS	WS	WS	WS	FWS	FWS
36	LAKSHADWEEP	WS	WS	WS	WS	FWS	FWS	FWS

Legend	Category	% Stations
WS	Widespread/Most Places	76-100
FWS	Fairly Widespread/Many Places	51-75
SCT	Scattered/ A Few Places	26-50
ISOL	Isolated Places	1-25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A CHILD'S CHILDHOOD IS FOR LEARNING
DON'T USE THEIR CHILDHOOD FOR EARNING
SAY NO TO CHILD LABOUR

UPCOUNTRY SPOT RATES

(Rs./Qtl)

Standard Descriptions with Basic Grade & Staple in Millimetres based on Upper Half Mean Length [By law 66 (A) (a) (4)]								Spot Rate (Upcountry) 2023-24 Crop July 2024					
Sr. No.	Growth	Grade Standard	Grade	Staple	Micronaire	Gravimetric Trash	Strength /GPT	8th	9th	10th	11th	12th	13th
1	P/H/R	ICS-101	Fine	Below 22mm	5.0 – 7.0	4%	15	14088 (50100)	14088 (50100)	14088 (50100)	14229 (50600)	14229 (50600)	14285 (50800)
2	P/H/R (SG)	ICS-201	Fine	Below 22mm	5.0 – 7.0	4.5%	15	14257 (50700)	14257 (50700)	14257 (50700)	14397 (51200)	14397 (51200)	14454 (51400)
3	GUJ	ICS-102	Fine	22mm	4.0 – 6.0	13%	20	11614 (41300)	11585 (41200)	11557 (41100)	11529 (41000)	11501 (40900)	11473 (40800)
4	KAR	ICS-103	Fine	22mm	4.5 – 6.0	6%	21	12766 (45400)	12766 (45400)	12766 (45400)	12710 (45200)	12710 (45200)	12710 (45200)
5	M/M (P)	ICS-104	Fine	23mm	4.5 – 7.0	4%	22	15157 (53900)	15157 (53900)	15157 (53900)	15157 (53900)	15157 (53900)	15157 (53900)
6	P/H/R (U) (SG)	ICS-202	Fine	27mm	3.5 – 4.9	4.5%	26	15635 (55600)	15635 (55600)	15635 (55600)	15691 (55800)	15691 (55800)	15747 (56000)
7	M/M(P)/ SA/TL	ICS-105	Fine	26mm	3.0 – 3.4	4%	25	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
8	P/H/R(U)	ICS-105	Fine	27mm	3.5 – 4.9	4%	26	15775 (56100)	15775 (56100)	15775 (56100)	15832 (56300)	15832 (56300)	15888 (56500)
9	M/M(P)/ SA/TL/G	ICS-105	Fine	27mm	3.0 – 3.4	4%	25	14594 (51900)	14594 (51900)	14538 (51700)	14538 (51700)	14482 (51500)	14482 (51500)
10	M/M(P)/ SA/TL	ICS-105	Fine	27mm	3.5 – 4.9	3.5%	26	15578 (55400)	15578 (55400)	15550 (55300)	15578 (55400)	15550 (55300)	15578 (55400)
11	P/H/R(U)	ICS-105	Fine	28mm	3.5 – 4.9	4%	27	15972 (56800)	15972 (56800)	15972 (56800)	16000 (56900)	16000 (56900)	16056 (57100)
12	M/M(P)	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	16085 (57200)	16085 (57200)	16056 (57100)	16085 (57200)	16056 (57100)	16085 (57200)
13	SA/TL/K	ICS-105	Fine	28mm	3.7 – 4.5	3.5%	27	16197 (57600)	16197 (57600)	16169 (57500)	16197 (57600)	16169 (57500)	16197 (57600)
14	GUJ	ICS-105	Fine	28mm	3.7 – 4.5	3%	27	16113 (57300)	16113 (57300)	16085 (57200)	16113 (57300)	16085 (57200)	16113 (57300)
15	R(L)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
16	M/M(P)	ICS-105	Fine	29mm	3.7 – 4.5	3.5%	28	16338 (58100)	16338 (58100)	16310 (58000)	16366 (58200)	16338 (58100)	16366 (58200)
17	SA/TL/K	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	16450 (58500)	16450 (58500)	16422 (58400)	16478 (58600)	16450 (58500)	16478 (58600)
18	GUJ	ICS-105	Fine	29mm	3.7 – 4.5	3%	28	16338 (58100)	16338 (58100)	16310 (58000)	16366 (58200)	16338 (58100)	16366 (58200)
19	M/M(P)	ICS-105	Fine	30mm	3.7 – 4.5	3%	29	16703 (59400)	16703 (59400)	16703 (59400)	16703 (59400)	16647 (59200)	16647 (59200)
20	SA/TL/K/O	ICS-105	Fine	30mm	3.7 – 4.5	3%	29	16731 (59500)	16731 (59500)	16731 (59500)	16731 (59500)	16703 (59400)	16703 (59400)
21	M/M(P)	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
22	SA/TL/ K / TN/O	ICS-105	Fine	31mm	3.7 – 4.5	3%	30	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
23	SA/TL/K/ TN/O	ICS-106	Fine	32mm	3.5 – 4.2	3%	31	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)	N.A. (N.A.)
24	M/M(P)	ICS-107	Fine	34mm	2.8 - 3.7	4%	33	23058 (82000)	23058 (82000)	23058 (82000)	23199 (82500)	23199 (82500)	23199 (82500)
25	K/TN	ICS-107	Fine	34mm	2.8 - 3.7	3.5%	34	23902 (85000)	23902 (85000)	23902 (85000)	23761 (84500)	23761 (84500)	23761 (84500)
26	M/M(P)	ICS-107	Fine	35mm	2.8 - 3.7	4%	35	23480 (83500)	23480 (83500)	23480 (83500)	23621 (84000)	23621 (84000)	23621 (84000)
27	K/TN	ICS-107	Fine	35mm	2.8 - 3.7	3.5%	35	24464 (87000)	24464 (87000)	24464 (87000)	24324 (86500)	24324 (86500)	24324 (86500)

(Note: Figures in bracket indicate prices in Rs./Candy)