

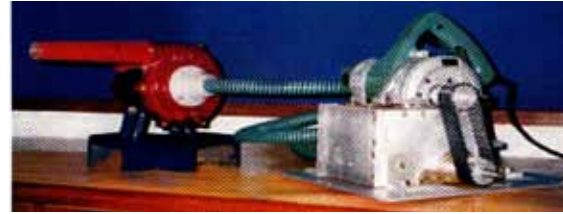
TRIMMING MACHINE

Salient Features:

1. The frame is of aluminium to reduce weight of the machine.
2. Timer pulley and belt are used for accuracy
3. High-speed steel helical cutter is used for finer cutting and more efficient process.
4. Blower is used to such out the cut piles from the machine.

Basic Components:

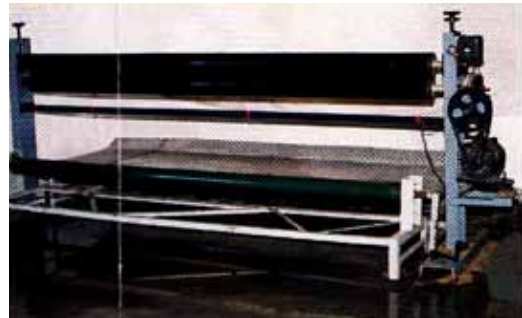
Frame Base plate, Timer belt, Motor Blower, Blower Base Support Timer Pulley, Helical Cutter, Cutting Plate and Flexible Pipe.



Trimming device 16"x11"x10" Rs. 10,000/-

COMPARATIVE STUDY		
	Traditional	Improved
Quality	Pile length is not uniform.	Pile length is uniform
Productivity	Requires more time, slow action and difficult movement.	Less time to cut the piles last action, easy movement
Human effort	More human effort for the same action.	Less effort as movement and action is fast

SQUEEZING MACHINE



Squeaking Machine 12"x3"x3 Rs. 25,000 With trolley motor

Salient Features:

1. The machine is both motor as well as manually operated.
2. The height of the rollers from ground is reduced to the desired level for facilitating easy feeding to the rollers.
3. Amount of water squeezed out is approx 30-50% depending upon the quality of the carpet being squeezed.

Basic Components:

Squeezing Roller, Wheel Handle Structure, Worm Gear, Trolley, Base Channel Trolley, Hand Wheel, Trolley, Loading Trolley, and Unloading Trolley.

COMPARATIVE STUDY		
	Traditional	Improved
Quality	Direction of pile is not maintained	Direction of pile is maintained.
Productivity	12 hours is needed to squeeze out water	1/2 hour is required to squeeze out 33 to 50% water.
Human effort	More	Less

DRYING CHAMBER

Salient Features:

1. Coal/agro waste as the primary combustion fuel and electrical.
2. Improved system for loading unloading.
3. Provision of re-circulation of air.
4. Room for four carpets for drying at one time.
5. Running cost reduced.

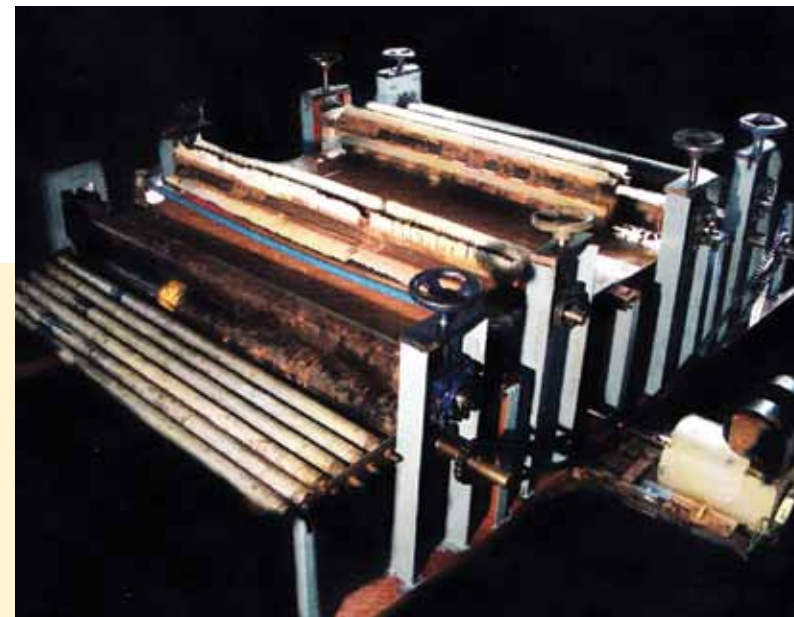
Basic Components:

Heat Furnace, Copper Tube, Blower, Carpet Hanging Frame, M.S. Structure, Fiber Sheets, Circulating Fan, Trolley, Exhaust, Re-circulating Duct, and Chamber.



Drying process 10'x8'x5' Rs. 98,000/-

COMPARATIVE STUDY		
	Traditional	Improved
Quality	Time required for drying is more depends upon weather conditions floor space area required depending upon no. of carpets	Time required for drying is less, independent of weather conditions floor space area required is fixed, operates on both fossil fuel such as cowdung & electrical.
Human effort	Less	Less



Semi Automatic washing plant 5.5'x9'x3' Rs. 96,000/-

SEMI AUTOMATIC WASHING PLANT

Salient Features

1. Three operations incorporated, mixing, scrapping and squeezing.
2. Two sets of squeezing rollers for squeezing water and chemical are responsible for carpet movement.
3. Brush roller for chemical mixing and removing dirt.
4. Chemical soaking trolley provided.
5. Chemical and water tanks provided.
6. Reorculatation of water and chemical.

COMPARATIVE STUDY		
	Traditional	Improved
Quality	Pile opening is less, gloss is less, orientation is not proper chemical spraying is not proper; weight of person on the carpet affects carpet quality.	Pipe opening is more, gloss is more, orientation is proper chemical spraying is proper, no weight on carpet.
Productivity	Man power required is more; mixing, scrapping and squeezing actions are separate causing more time.	Man power required is one, mixing, scrapping and squeezing actions combined resulting is less time.
Human effort	Hazardous chemical comes directly in contact with skin. More efforts is required	Safe Less effort s required

YOUR ADVANTAGE

Estimate payback period (as per rates in 2003)

Machine	Payback period	Basis
Loom	One year	Additional cost Rs.4000/- Savings Rs. 20/- per working day
Washing Plant	Three years	Total cost Rs. 96,000/- Saving: two hours / 1 carpet 10 carpets/ 1 day
Drying Chamber	Two years	Total Cost Rs. 98,000/- per drying chamber monthly income: Rs one lakh/month Turnover: 10 carpets/day, 13 during 3 months. year (monsoon/winter)

For further Technical details contact: Prof. R. Prasad Ph. 26596251, 26591385, 26526135, E-mail : rprasad@rdat.iitd.ernet.in
Dr. S.K. Saha Ph 26591135, 26596320 E-mail saha@mech.iitd.ernet.in
Dr. K.K. Goswami, Phone No. 05414-225504, E-mail : iictbhadohi@satyam.net.in

Name of the Manufacturers:

1. **M/s Sudershan Machinery Pvt. Ltd.**
F-652, 9F2, Vashwakarma Industrial Area
Jaipur-302013, Ph. : 0141-2335154, Fac : 0141-2331519
Res: 0141-2340698



Marketing by:

CARPET EXPORT PROMOTION COUNCIL

(Set up by Ministry of Textiles, Govt. of India)

110-A,/1, Krishna Nagar, Street No. 5, Safdarjung Enclave, New Delhi-110029 INDIA, Tel: 26102742, 26101024 Telefax: 26165299,
E-mail: cepc@nda.vsnl.net.in

Sponsored by: Office of the Development Commissioner (Handcrafts) Ministry of Textiles, Govt. of India & UNDP

2. **M/s Ramesh Vishwakarma Welding Works**
Shivalamahanta, Mirzapur Ph: 05442-268550

3. **M/s DMT Hydraulics Ltd.**
46/1153 Jagdishpura Road,
Opp. Prabhu Talkies Agra (U.P.)
Ph: 0562-2112503

Technological improvement of the tools and process used by craftsmen in carpet industries of India

In Technical collaboration with Indian Institute of Technology Delhi



SELECTED TOOLS AND PROCESSES FOR DEVELOPMENT

- Development of new carpet loom
- Development of new washing machine
- Development of new carpet drying process
- Development of new moisture measuring device
- Development of new trimming device
- Optimization of design of hand tools

1. **Beater (panja)**
2. **Knife (Chhura)**
3. **Scraper (Phawra)**
4. **Metal comb**



CARPET EXPORT PROMOTION COUNCIL

Improved Metallic Loom For Hand-Knotted Carpets

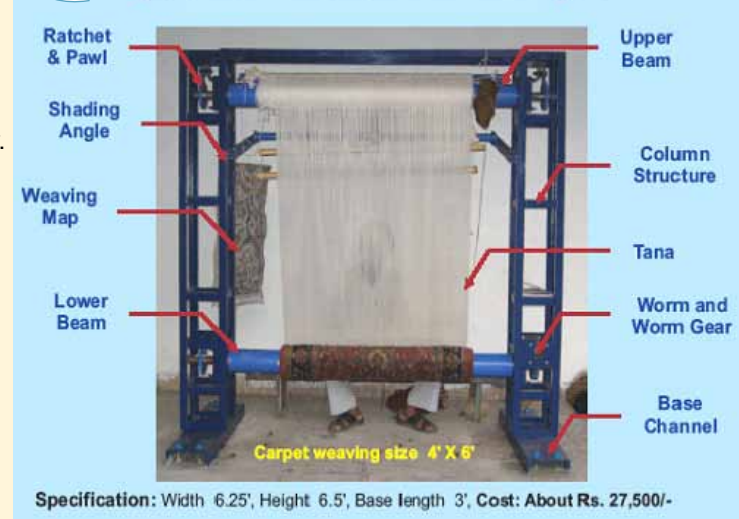
NEW (2010)

Silent Features:

1. Easy to Assemble
2. Long Life: Rigid metallic structure for long time
3. Environment friendly: Fabricated using metals only. No use of wood. Hence, environmental friendly
4. Aesthetics: Colorful and modern design
5. Maintenance: Minimum maintenance required
6. Locking device: Stronger locking devices on both sides of upper beam, and one side of lower beam

Merits:

1. Strong: High strength and rigidity due to seamless tubes for lower and upper beams. More stiffness allowing more tension in the string/Tana
2. Ease of Operation: Easy and fast tensioning with the help of worm and worm gear arrangement
3. Less effort: Only one person can generate tension in the string/Tana. Smooth rotation of work due to roller bearing. Bush bearings at the beam's ends provide smoothness
4. Human safety: Reliable than wooden looms
5. Easy and effective shading: Polypropylene shading rollers which give easy shading action
6. Less Time: Minimizes tensioning, shading, loading and unloading times



Basic Components:

Upper Beam, Support Channel, Shading Pipe, Polypropylene Roller, Hook Cover, Handle, Base Channel, Pawl, Ratchet, Lower Beam and Tensioning Device.

Carpet Loom Big 12' X 10'X3' Rs. 16000/-
Medium 9' X 9'X3' Rs. 14500/-
Small 6' X 5'X3' Rs. 13000/-

LOOM

Developments in 2003

Salient features:

1. Beams made with the seamless (extruded) hollow pipes instead of rolled pipes, which are stronger than the former to avoid any bending.
2. Capacity of tensioning device was increased, according to the strongest threads available.
3. Stronger locking devices provide on both sides of the upper beam.
4. Profile of hooks changed and covered by curved strip to avoid any possibility of damaging the carpet.

COMPARATIVE STUDY		
	Traditional (Wooden)	Improved (Metallic)
Quality	Bending No uniform tension	No bending Uniform tension
Productivity	Tensioning time is more and difficult	Tensioning time is less and easy
Human effort	Cumbersome shading	Easy shading

BEATER



Beater Rs. 150/-

Advantages:

1. Positive gripping with cushioning as comfortable operation.
2. Ergonomically and aesthetically designed handle.
3. The gap between the blades optimized.
4. Shape of the blades improved.



Metal comb Rs. 150/-

METAL COMB

Salient Feature:

1. Uniform teeth space
2. Teeth thickness reduced
3. Comfortable rubber handle provided
4. Coating provided for longer life
5. Shape of the blade is changed using ergonomic and aesthetic concepts in designs

SCRAPPER



Scrapper Rs. 250/-

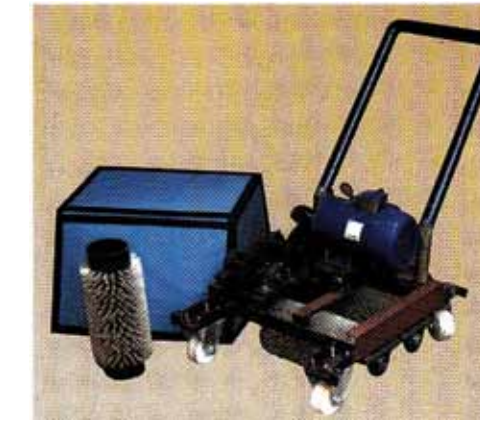
KNIFE

Advantages:

1. Shapes of the blade and handle are changed using ergonomic and aesthetic concepts in designs.
2. Spring steel was used for making cutter, which has self-sharpening property.
3. Weight of the knife reduced to avoid any harm to the fingers and reduce fatigue to the wrist/arm during operation.

COMPARATIVE STUDY		
	Traditional	Improved
Quality	Poor Uniformity is not mentioned	Aesthetically and ergonomically designed Standardized parts have been used
Productivity	Less Life is less	More Life is more
Human effort	More Cumbersome to use	Less Easy and comfortable to use

MIXING MACHINE



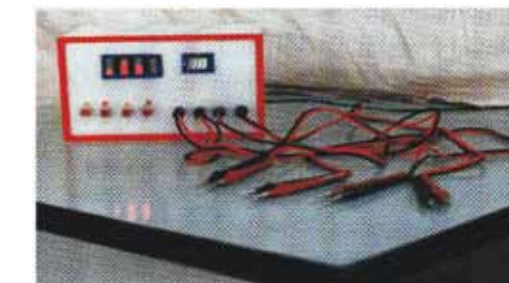
Mixing Machine 1.6'x2'x6' Rs. 20,000/-

The mixing machine primarily consists of two soft brushes, mounted on two rollers moving in opposite directions.

Salient features:

1. Soft brushes mounted on two rollers that rotate in opposite directions provide, proper chemical mixing.
2. The brushes thoroughly remove all dirt from the carpet.
3. The piles are operated in both the directions in single movement of the machine.
4. Due to the constant speed of mixing brushes mixing is uniform
5. Quality of washing and mixing is much better.

COMPARATIVE STUDY OF MIXING AND SCRAPPING MACHINE		
	Traditional	Improved
Quality	Pile opening is less Orientation is not proper Chemical spraying is not proper	Pile opening is more Orientation is proper Chemical spraying is proper
Productivity	More man hours required	Less man hours required
Human effort	Hazardous chemical comes directly in contact with skin	Safe

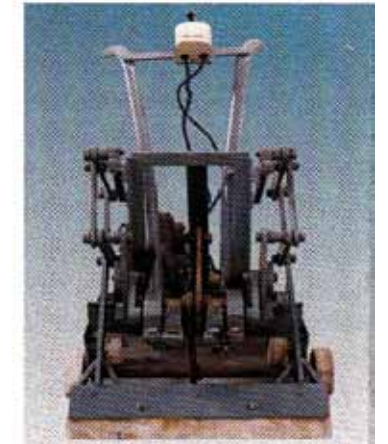


Moisture measuring device 9.5"x7"x6.5" Rs. 9,500/-

Basic Components

Graphical Display, Digital Display, Box, Probe selector, Probe outlet and Probe

SCRAPPING MACHINE



Scraping Machine 3'x2'x2.5' Rs. 35,000/-

Salient features:

1. Speed of the scrapper is same as that of manual speed of scrapping.
2. There is no vibration.
3. The machine is supported on 5 wheels; front wheel is powered.
4. A long life reduction gearbox is provided.
5. A single person can easily handle the machine.

Basic Components

Electric Switch, handle, Pantograph Mechanism, Coupler, Bearing block, Scrapper Pad, Chain Drive, Pad Cover, Electric Motor, Reduction Gear and Driving Wheel.

MOISTURE METER

Salient Features:

1. Based on principle of conduction.
2. Moisture of four carpets can be tested at a time.
3. Digital meter is calibrated on normal scale whereas graphical display shows reading from 0 to 30 on logarithm scale as this is the crucial stage of carpet drying.
4. Low cost