Posselt's Textile Journal

Vol. XXI. **July, 1917.** **No. 1**

TERRY PILE FABRICS.

Their Quality, Production, and Cost.

By H. Barlow.

(Continued from June issue.)

Selection of Yarns.

In selecting warp and filling yarn, it is necessary to consider: *first,* the subsequent preparatory processes; *second,* the requirements of each warp and pick for satisfactory weaving and loop forming; and *third,* the appearance of the woven fabric.

Cost or price of yarns may be of first importance, but it ought not to be the only determining factor in placing yarn orders. If bleached samples of equal make, weight and price were submitted by manufacturers, an expert would have little or no difficulty in preferring a particular sample, by reason of its superior appearance, fullness of handle and bleach.

Warp Yarns.

The yarns for terry warp have not to undergo strain during weaving, but only tension. They must, however, be strong enough to satisfactorily pass through the preparatory processes such as winding, beaming, warping, slashing and twisting, there being probably as much liability of breakage in any one of these operations as in actual weaving. There is little tension on the terry warp at the loom, and it passes forward into cloth from three to six times quicker than the ground warp, according to the times terry called for in a given length of cloth woven. The kind and quality of material used, directly influences the regularity of the loops.

Compare, for instance, the kind of loop formed in a striped terry fabric made from linen, heavy-sized cotton, and a soft twisted, unsized folded cotton. The linen yarn, though more absorbent than cotton, is hard, stiff, inelastic and irregular, consequently there is difficulty in shedding owing to the slack ends, and when beating-up takes place the threads bend at different points, and in all directions, with an utter absence of regularity as compared with the soft folded cotton yarn. A regular and fully terry is directly influenced by the turns of twist per inch, softness, suppleness and regularity of yarn and the percentage of size. Very coarse inferior yarns are sometimes used on account of their low price, but they are difficult to weave and produce a very imperfect, though cheap fabric.

The yarns for ground warp should be of a superior quality, strong, regular and well twisted. Strength is of first importance. If (for example) 14's counts is required for ground and terry warps, yarn of a superior quality would be used for the former. To obtain regularity in loops, without variation in height, it is necessary to subject the warp to a maximum tension, or as great a tension as is possible without interfering with shedding and picking, hence the need for a strong and regular yarn.

Filling Yarns.

Here softness and fullness of the yarn is desired, but the filling must not be weak, otherwise it will frequently break during weaving and which is a serious matter, since it is impossible then to keep the cloth free from marks. The cops should be firm and a good fit for the shuttle tongue, in order that a minimum of waste will be made with these coarse fillings used.

Photographic representations of three terry fabrics 1, 2 and 3 (Fig. 10) are given.

Sample 1 shows how the regularity of the loop is affected by using a heavy sized single yarn with 12 per cent sago size, in conjunction with stripes of unsized soft twisted two-fold yarn.

Sample 2 has stripes of 3-pick terry 8 x 6 honeycomb.

Sample 3 has terry formed from cotton and linen yarns. The cotton terry is regular, the linen terry is irregular and loops are missing in certain places.

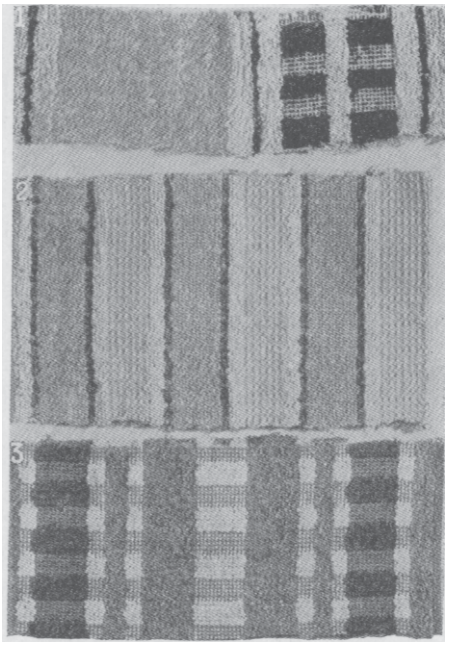

Fig. 10

To Show Difference in Twist.

To see the effect produced on the terry pile by varying the turns of twist per inch, a terry warp was made from 20's yarn, beamed so that there were four stripes with 12, 16, 20 and 24 turns per inch, respectively. The result was interesting. The loops formed with yarn having 12 turns of twist appeared soft, full and untwisted; the loops formed from yarn having 24 turns of twist were twisted up, hard, and had a rough feel. The terry with the lower twist took also a much better bleach than the high twisted terry.

Preparation of Warp and Filling.

During recent years the tendency has been to economize in preparatory wages, to cut down expenses and to increase production, by using larger flanged warp beams or tubes; also to reduce and facilitate the handling of material by the adoption of labor-saving contrivances.

The yarn for grey warps (when bought in the market) is purchased on backbeams, then slasher sized, followed by drawing-in or twisting at the loom. A few manufacturers, with not enough looms to keep a

slashing machine employed, adopt the ball sizing and beaming process, but which is not as satisfactory. As an example of preparation for warp containing (*a*) grey sized single, (*b*) bleached and dyed and sized single, and (*c*) unsized two-fold yarn, the following scale is submitted:

(*b*) Single yarn colored. Bleaching or dyeing and sizing in hank

(*c*) Two-folded colored unsized. Bleaching or dyeing in cheese

Drum winding

Warping on flanged tube (*b*) and (*c*)

(*a*) Slasher sizing and tinting grey, and running in colored from flanged tube, according to pattern.

Drawing-in, or twisting at the loom.

Filling is usually purchased in pin cop size, as there are special reasons in this class of work against using

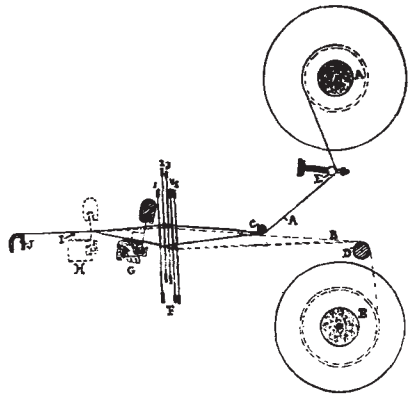

Fig. 11

large cops, which require large sheds, and, on account of the coarse counts cause excessive amount of waste. The colored filling is either cop or hank dyed, according to the quality or requirements of the cloth, and there should be systematic storing and labelling so as to prevent mixing the colors of filling, some of which may, while others may not be fast for bleaching. The coarse bleached filling, such as 3's counts for cord headings, may be wound on the bare spindle to correct size and the cop then forced into the body of the shuttle which is grooved to hold it securely. Sometimes, however, when colored yarn is wound and used in this manner, the color of the filling is transferred to the white or grey warp, thus staining it.

When forming linen terry, the filling may be soaped, as this destroys the resiliency of the thread, and the picks slide more easily along the ground warp into position; there is not the same pulling back of the terry, no matter how heavily the terry warp is weighted. The disadvantage is that the loops being damp, are easily flattened by pressure on the breast beam and cloth roller, and cannot be raised again. The appearance of the terry is much better when dry filling is used. Colored or dyed fillings should be soft and not harsh, or the picks will not readily slide along the ground warp; the latter being slackened, the terry will gradually go off the cloth, particularly when the bobbin or tube is almost finished. Often the weaver resorts to oiling the yarn, which is decidedly an objectionable and expensive process. The winder is in some cases provided with wax to rub on the hank, but it is much the better plan to arrange for the dyer to run the yarn through a weak lubricating solution.

Sizing Terry Yarns.

Slasher sizing is universally adopted. It is a cheap and productive method, and with care, attention, and experience on the part of the slasher will yield satisfactory results. Sago is very suitable as an adhesive substance, giving a more crisp feel to the yarn than wheat flour, and there is not the same need for storage and fermentation. When mixed with water its strength is very much reduced by standing, and only a sufficient quantity is mixed at one time that will last for two or three days. As a basis for a mixing, the following combination is given, each ingredient being given in its lowest proportion: 20 lbs. sago, 2 lbs tallow, 1 lb. soap.

Yarn sized with sago as an adhesive should not be allowed to go on the beam damp, or the warp-threads will readily cling together. What is required in sizing the terry warp, is to lay or fasten down the projecting fibres, remembering to keep the threads as pliable and supple as possible. The addition of 6 per cent sago size is quite sufficient for ordinary purposes. The ground warp may be sized with 10 per cent sago, chiefly to lay the fibre, protect and strengthen the yarn, as well as to withstand the tension which it is subject to during weaving at the loom. Any undue tendency to harshness in the sized thread should be counteracted by the use of tallow.

Great care is necessary in running the warps to keep the yarn equal in diameter when two or more flanged tubes are required to make one warp for the weaver, otherwise more yarn will be given off in certain places than in others, and cause either defective cloth, or waste in making them equal in diameter. Ends missing or ends clinging together, are also a hindrance to the weaver and the cause of defective cloth.

When tinting the size, the tint should be kept up by frequent small additions and not left go for a length of time, as this causes deep patches and decreasing tones of color.

Manufacturing Notes.

Terry fabrics are made in varying weights and qualities, from light to heavy, and from low to high numbers of picks, and since a loom is sometimes changed from light to heavy, cotton or linen terry, looms should be built strong, heavy and rigid enough for the heavy structures, so that there will be a minimum of vibration when picking takes place, and a smart, easy and forcible beat-up when forming a loop and beating up the cord weave in the headings. A reasonable speed for a 52 in. reed space loom is 150 picks per minute. The shed must be as small as it can be made, considering perfect running of the loom; the slay must be governed, and the shedding and picking arranged and timed to suit this; ample "pick" should be available.

THE SHED LINES.

In weaving terry fabrics it is a distinct advantage in all makes of cloth to have the tension equal on the top and bottom shed lines, and on each individual thread in each line of warp.

The essential condition is: the bottom shed line

should lie equally on the raceboard when it is in its lowest position, and that the top shed line is to be positioned so that it will allow the shuttle to conveniently pass in and out of the shed.

After these two conditions have been attended to, the back rest must be fixed so as to give equality of tension on the warp comprising top and bottom shed lines.

Diagram Fig. 11 shows a plan of a loom with its warp in position in which these conditions are fulfilled. In the same *A* (shown in full lines) indicates

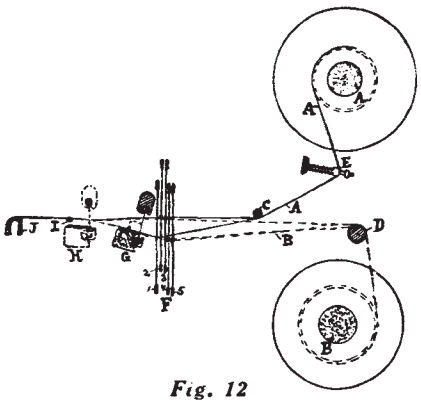

Fig. 12

the pile warp; *B* (shown by dotted lines) the ground warp; *C* the back rest for the pile warp; *D* the back rest for the ground warp; *E* the spring tension roller for the pile warp; *F* the set of pile and ground harnesses; *G* lay and reed in rear position when inserting the filling, and *H* the same when beating up; *I* cloth rod; *J* breastbeam.

By measurement (placing your ruler on top of back rest *D* and the fell of the cloth) the length of the top and bottom shed lines of the ground warp will be found approximately the same.

The back rest *D* was then put level with the fell of cloth (see Fig. 12) and when instead of the tension being equally shared by the ground warp, it is transferred to the lower shed line, the length of the latter being greater than the top shed line. Place the fine edge of your ruler on top of back rest *D* and the fell of the cloth, and compare it with procedure done in connection with Fig. 11. By the arrangement shown in Fig. 12 there are extremes of tension on the warp-threads, and when on weaving it was found necessary to fix additional springs to the harness so as to keep the bottom shed down on the raceboard, and it was only with difficulty that the shuttle could be got through the shed and into the box.

The following features were noticed:

(1) The picks would not slide along the ground warp so readily as when the threads were equally taut.

(2) The picks were not kept in the right position after the beat-up, the ground warp not having equal holding power; consequently the loop was reduced by the pull of the terry warp.

(3) The position of the cloth fell was ever changing from the normal central position downwards, returning again as the bottom shed ground harness lifted.

(4) The excessive tension on the warp when forming the bottom shed caused more breakages.

The same experiment, having the back rest of the loom level with the fell of the cloth was repeated on a loom equipped with a Jacquard Machine for controlling the terry warp, using regular harnesses for carrying the ground warp, the latter being operated by cams, driven from the bottom shaft of the loom; springs being fixed above the harnesses to return them and form the top shed. This made it easier to keep the bottom shed down to the raceboard, but the terry was pulled back as before.

Then the back rest was lowered to extreme position, *viz.*, level with the heddle-eyes in the back shaft when down. On commencing to weave, the top shed quickly became tight and overcame the pull of the springs, in turn closing the shed, extra springs being necessary to prevent the top shed from closing on the shuttle as it passed through the shed.

Equality of tension is also very important when weaving the coarse filling in the cord headings, since inequality would put an unbearable tension upon the ground warp drawn through the two harnesses, one of which has to be either up or down, alone.

(*To be continued.*)

Bleaching of Calico with Barium Peroxide and Sodium Peroxide.

By M. Justin Mueller.

Some thirty years ago, the attention of the textile trade was called to the bleaching of calico, etc. with peroxides, the process then practised was:

After bowking, the calico was entered into a milk of barium peroxide (20 lbs. of peroxide in suspension in 200 gallons of water) and left in this liquor for two hours. The material was then passed through a 2 deg. *B.* bath of sulphuric acid, and piled up on the floor. After remaining in a heap from six to fifteen hours, it was thoroughly washed, and if necessary, the process was repeated. This method, considered from a practical point of view, seemed to have attracted little attention.

Chloride of lime bleaching, as far as cotton is concerned, will always be more economical than bleaching with peroxides, and as barium peroxide is insoluble, it has disadvantages of its own.

At the time the first mentioned process of bleaching with peroxides was introduced in the textile industry, the industrial use of Peroxide of Sodium was unknown; it was first employed about 1893, and at once found favor with the trade. This salt is completely soluble in water, and has other advantages over barium salts.

In order to decompose sodium peroxide, an acid is not absolutely indispensable. In treating animal fibres, and wool in particular, it is sufficient to neutralise the alkali produced by the decomposition. Sulphate of magnesium is often used for this purpose; by double decomposition, sodium sulphate and magnesium hydroxide are produced, which have no harmful effect on the wool fibre.

The action of the resultant peroxide of hydrogen on the magnesium hydroxide brings about the formation of a hydrate of magnesium peroxide, which parts readily with its oxygen and aids the bleaching action very efficiently. About three parts of magnesium sulphate are used with one part of sodium peroxide.

The same reaction occurs with the alkaline perborates. If a salt of magnesium is added to the bleaching liquor, a perborate of magnesium is formed, or hydrate of the peroxide, with the alkaline borate remaining in solution.