

their springs will pull up the three healds and springs quite easily, but if the three are required to pull up the seven a jerking of the loom may be perceived, says a writer in the Textile Recorder. The jerking is caused by the extra power exerted in raising the seven healds without a similar counterbalancing pull. This inequality of lifting the healds is often demonstrated in designing, and deters the production of many good patterns, which are discarded rather than put the loom to the continued strain of weaving them. The same inconvenience is experienced when producing vestings or other goods woven on the double cloth principle, where the face warp and a portion of the back warp is lifted in order to put the weft into the back cloth. When the whole capacity of the dobby is not required for these cloths, some attempt to equalize the lift is often made by attaching the surplus jacks direct to strings, and lifting them up for those picks where very few healds are raised.

Positive shedding motions are not subject to this jerking, and are better adapted for this class of work than machines which require the aid of springs. Many attempts have been made to lessen the evil of non-positive shedding by relieving the spring of its full extension. Sufficient spring power is required to keep the healds to the bottom of the shed, and all further extension is better avoided, if possible. Spring relieving motions of the past have been made on the quadrant principle, or by the intervention of an eccentric, which is turned round to its least diameter as the heald rises, and thereby relieves the connecting band instead of extending the spring. A new plan, which is showing some signs of a more general introduction, is "Dawson and Lloyd's Patent." In using this method, when the shed is formed the spring is extended about half the distance of a direct spring, but its power on the heald is not increased in this ratio because of the decrease caused by its position on the lever. The springs in this motion are always acting on the healds to some extent, being in position to pull them down when fully extended. The difficulty with some quadrant motions is the tendency to pull against a dead centre when the heald is at its highest position. Some method of satisfactorily effecting the results which are claimed for this machine is required, not particularly as a saving of power in working the loom, which would not be a great matter where the even lifts were adhered to, but for increasing the scope of the dobby in cloths requiring uneven lifts, and also taking the strain from the healds, which will, doubtless, last much longer. Many manufacturers of fancy figured cloths do not provide healds which are knit according to the pattern of draft, but choice must be made from a variety of counts of evenly-knit healds. In these cases the threads do not go perfectly straight from front to back. Perhaps one stripe will be drawn on the back shafts, being one-quarter of an inch in the healds and one-eighth of an inch in the reed. The opening left in the front healds for these threads to pass through is practically nil, and the more rigid the healds

are held the greater will be the friction on the yarn when shedding.

Attempts have been made to relieve the healds of their rigidity in the ordinary dobby, and at the same time to avoid the objectionable jerking motion of the loom when not more than half the dobby capacity was required, by pegging the lattice which works the back jacks in the opposite manner from the front and connecting them by cords round pulleys to the bottom of the healds. The springs are dispensed with in this way, and a positive motion effected; but the liability of the hooks to miss or catch incorrectly makes the method a practical failure, causing the cords to break or the sheds not to be formed. The spring-relieving motion is also arranged with one row of levers, and a suitable frame for securing it to the top rail of the loom, when it may be applied as a top motion for under tappets, or it may be used in connection with side tappets instead of top jacks, but this is of no advantage beyond allowing a dobby loom to use side tappets without removing the dobby in such cases as when sateens or similar work is more in demand than dobby-figured cloth, as appears to be the case at the present time.

SCOURING WOOL.

A point of special importance concerning the scouring of wool is the water to be used. Good machinery and soaps may be bought, but if the water is bad the results will be unsatisfactory. Some waters have to be distilled before they are suitable for washing wool, while other kinds need only softening, but in any case the water should be soft. The average mill has access to rain, river and well waters, but the principal source of these is rain. Rain water, from the absence of earthy salts, is very soft, and on that account is preferable to any hard water. Rain, after it reaches the earth, soaks down into it, and during its passage through various strata, dissolves certain salts, etc., the quantity and quality of which vary with the nature of the strata with which it comes in contact. River water usually contains from 10 to 25 grains of solid matter per imperial gallon of 70,000 grains. The quantity varies with the time of the year and the dryness of the season. But in any case soft water always gives the best results, and should be used in wool scouring, if at all procurable.

In considering the ingredients used in wool scouring, urine is often used. The urine is usually stale before using, and consequently contains not only ammonia, but a large amount of potash. The potash causes the whiteness, and the ammonia will saponify the animal grease, and when thrown into the scouring bath in a warm state the grease will easily wash off. The sheep feed upon vegetation which contains potash more or less, and that will be absorbed in the blood, and so reaches the wool upon the skin. The potash is a property which the wool necessarily contains. Potash is, therefore, required in some form or other to whiten the wool, and this is supplied in the soap.