

bleach is admitted to them. Another rinsing intervenes before the goods are soured with sulphuric acid. The novelty seems to consist in the bleach being made by electrolysis, and used as it is made.

#### TABLE FOR CONVERSION OF THERMOMETER READINGS.

Degrees Centigrade  $\times 1.8 + 32 =$  degrees Fahrenheit.

Fahrenheit  $- 32$

Degrees  $\frac{\quad}{1.8} =$  degrees Centigrade.

1.8

Reaumer  $\times 9$

Degrees  $\frac{\quad}{4} + 32 =$  degrees Fahrenheit.

4

(Fahrenheit  $- 32$ )  $\times 4$

Degrees  $\frac{\quad}{9} =$  degrees Reaumer.

9

Reaumer  $\times 5$

Degrees  $\frac{\quad}{4} =$  degrees Centigrade.

4

Centigrade  $\times 4$

Degrees  $\frac{\quad}{5} =$  degrees Reaumer.

5

#### KNOTS AND KNOT TYING.

The subject of knots and knot tying has been a problem for cotton manufacturers as long as cotton mills have existed. While a comparatively small and unimportant process, the spooling department is probably the source of as much trouble as any department in the mill. A bad knot causes trouble from the warper to the cloth room. In England, for many years, the manufacturers have claimed to tie weaver's knots. This does not, however, do away with the trouble, as it is as possible to leave a long end to a weaver's knot as it is to a spooler's knot. In the United States some mills have attempted to tie the weaver's knot.

Some time ago I was in a mill that claimed to tie weaver's knots exclusively. The superintendent took me to their spooling department, and standing in one corner of the room, we had a good opportunity to watch the spooler tenders. The girls near us were all tying weaver's knots, but glancing across the room, I saw several girls industriously tying spooler's knots. I called the superintendent's attention to this, and he readily admitted that it was only while the operatives were being watched that weaver's knots were tied. He said he did claim, though, that by paying the girls more than the other mills paid he was sure that if they did not tie a weaver's knot they would tie a good spooler's knot.

Much has been claimed for the weaver's knot in preference to the spooler's knot. The actual knot is very slightly smaller, but the great trouble from knots does not come from the knot itself, but from the long ends. Yarn tied with a short end spooler's knot will weave a better piece of cloth than yarn tied with weaver's knots when the ends vary in length.

Some two years ago a device was invented and shortly after marketed, that was intended to do away with bad knots. This machine ties a spooler's knot with short, even ends. Mills that have adopted this machine claim that a saving can be made in the cost of spooling of from 10 to 12 per cent. This, however, while a large item, is not the greatest advantage of such a machine. From tests made in a mill, we found that a section beam could be filled from half an hour

to an hour sooner than a section beam on which hand-tied work was being run.

The great saving, however, is neither in spooling or warping, but in the weave room. When a knot with a long end attempts to pass through the reed it almost invariably causes a break and the broken ends become entangled in the threads near it, and often seven or eight ends are broken before the trouble is discovered. Probably more than 95 per cent. of the seconds caused by imperfect knots can be obviated by the use of proper mechanism.

C. H. Draper has given me the following results of a test he made some time ago. The test covered the running of from four to ten looms for two or three months. The total running time, adding up that of each of the looms separately, was 378 days of 10 hours each. The number of warp ends broken was 3,641, out of which 1,722 were caused by bad knots. In the same time there were 731 stoppages due to slack threads, out of which 486 were due to bad knots. From these figures we find that 47 per cent. of warp breaks, 65 per cent. of slack threads, and 50 per cent. of these two faults added together, were due to bad knots. In these tests the looms were equipped with various kinds of mechanical stop motions made by the Draper Company and the cause of the trouble was in each case accurately noted down on the spot. Most of the slack threads caused by knots, and a large proportion of the warp breaks caused by knots, were due to the long, trailing ends left by the spooler tender.

If this machine will do away with bad knots, the work of the warper can be increased, and the capacity of the weave room increased, and at the same time the number of seconds reduced. As to whether it will do it or not, we will leave for the manufacturers to say.—Robert C. Webster, Boston, Mass.

#### DYEING NOILS AND LOOSE WOOL.

Noils are frequently mixed with loose, uncarded wool, in order to simplify and facilitate the dyeing of such mixtures, and it is often a question of dyeing comparatively small lots. By a shortened process, time and fuel are saved, of course, but then it is a speculation with the dyer whether or not the process will succeed. The better way is to dye the noils and the raw washed wool separately. If dyed together, the noils are almost always more felted than the wool, and the color of noils will almost without exception appear different from that of the wool. This is a serious defect if the material is to be used for unicolored goods. Furthermore, the disadvantage arises, in the case of mixtures, that the noils, if strongly felted, mix badly in the carding process. To avoid the disagreeable consequences of this mixed dyeing, it is better to dye each material by itself. In the case of loose wool, it is still possible to recognize the nature and source of the material, which cannot be accurately done in the case of noils. It frequently occurs that different kinds of wool are combed together, and thus it happens at times that a quite strong fibre will be combed in with defective goods in order to make the latter more fit for the manufacturing process. It hardly comes into consideration whether the inferior material be long or short, fine or coarse; the main question is to secure uniformity in the felting tendency. If this be the case, it is easy work for the dyer. He has only to be careful, when dealing with well-felting noils, that in mordanting the bath be kept near the boiling point without actually reaching it. If in this way the mordanting has lasted one and one-half hours, and the noils still remain loose and have the appearance of not being felted, a half-hour's boiling will do no harm. Nevertheless,