leaves a narrow internal channel, which, if visible, appears as a fine dark line. When bleached, the flax, *i. e.*, linen fibre, becomes snowy white and lustrous.

JUTE, if viewed under the microscope, is shown to consist of stiff lustrous and cylindrical fibrils, the walls being irregular in thickness, with a comparatively large central opening. Fig. 31 shows specimens of jute fibres magnified.

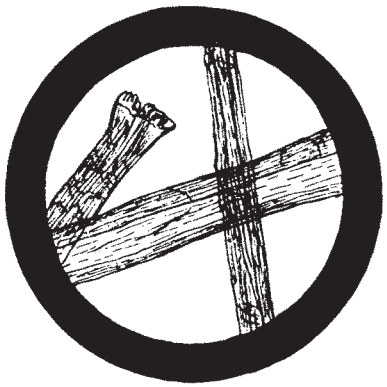

Fig. 32

RAMIE. These fibres are about twice the breadth of that of cotton, and appear under the microscope as a broad flat ribbon. Ramie fibres in the raw state have a soft, silky feel, but by pulling the staple, this quality becomes reduced and gives way to more or less harshness in the feel. Fig. 32 shows specimens of the fibre.

Fig. 33

HEMP. A view of this fibre is given in Fig. 33. It somewhat resembles that of flax, being however coarser and consequently stronger.

(*To be continued.*)

The supply of cotton in the United States for the year ended August 31, 1911, according to census returns, was 13,873,423 bales, consisting of 1,040,040 bales of stocks carried over from the previous year, 12,384,248 bales of cotton ginned during the year, 231,191 bales imported and a remainder to balance distribution. In 1910 the supply was 12,188,021 bales, and in 1909, 15,312,885 bales. The exports in 1911 were 56.1 per cent.; home consumption, 34 per cent.; while 9.9 per cent remained in the country at the close of the year.

GAUZE OR LENO WEAVING.

(*Continued from page 6.*)

Another step for constructing fancy gauze fabrics is to use two doups in connection with four or more ground-harnesses.

Figs. 20 and 21 are given to illustrate subject, Fig. 20 represents the drawing-in of the ground-harness set and the threading of the doups. In the same, we find two sections, *viz.:* ground-harnesses 1 and 2, with doup 1′, forming section 1; and ground-harnesses 3 and 4, with doup 2′, forming section 2.

In drawing-in and threading doups, we arranged two repeats for each section, thus 8 warp-threads in repeat of arrangement of pattern. This method of drawing-in the ground-harness set as well as threading of doups will, as shown in fabric Fig. 21, allow us to operate each section independent of the other at

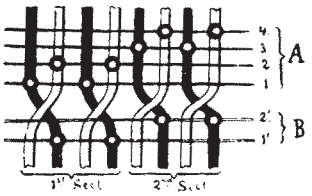

Fig. 20

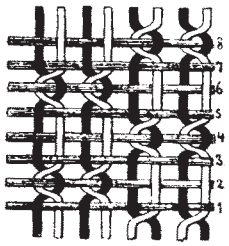

Fig. 21

different picks, providing means for thus forming additional figure effects in the fabric.

Fig. 22 shows the plan of another fancy gauze fabric produced with two doups. Fig. 23 illustrates the method of drawing-in the ground-harness set and the threading of the doups, which in the present ex-

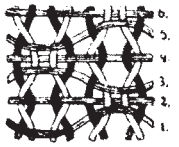

Fig. 22

ample is a right-handed and a left-handed doup for each set. Four ground-harnesses are used in connection with the two doups. Ground-harnesses 1 and 2

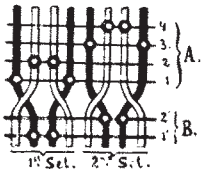

Fig. 23

(*A*) and doup 1′ (*B*) comprise the first set; ground-harnesses 3 and 4 (*A*) and doup 2′ (*B*) comprise the second set.

Fig. 24 illustrates another fancy gauze fabric, produced with two sets of doups.

Fig. 25 shows the plan to be observed for drawing-in the ground-harness set as well as the threading of the doups. Four ground-harnesses are used in connection with the two doups. Ground-harnesses 1 and 2 (*A*) and doup 1′ (*B*) comprise the first set; ground-harnesses 3 and 4 (*A*) and doup 2′ (*B*) comprise the second set.

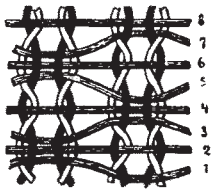

Fig. 24

Harness chain for fabric 24 is thus:
1st. pick, Skeletons 1′ and 2′, Ground 2 and 4.
2nd. pick, Skeleton 1′, Doup 2′, Ground 2.
3rd. pick, Same as pick one.
4th. pick, Doup 1′, Skeleton 2′, Ground 4.

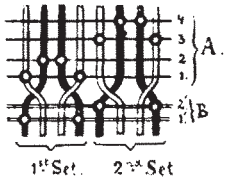

Fig. 25

Ground-harnesses 1 and 3 remain stationary during weaving.

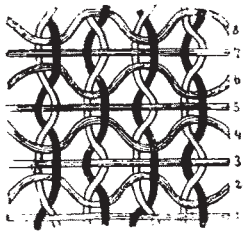

Fig. 26

Fig. 26 illustrates the plan for another fancy gauze fabric, constructed from the last example, using only warp threads 1, 2, 5 and 6 from the latter.

(*To be continued*)

Many methods are known for the waterproofing of textile fabrics intended for many purposes. In addition to these, the following suggestions will be of interest, the same referring to the treatment of materials for the out door use. The fabric or garment is for this purpose treated by steeping for some time in a warm bath of 450 grms. of soap in 4 litres of water; they are next impregnated and steeped in a solution of 450 grms. of alum in 4½ litres of warm water.

This causes the precipitation of an alumina soap on the material which very effectively exerts the water-repelling properties desired.

The friction accompanying the wearing of the article gradually causes the protective coating to be removed, but it is then only necessary to repeat the treatment to renew the properties of the material.

COTTON CARDING.

(*Continued from page 10.*)

Setting Mote Knives, Undercasing and Lickerin.

The mote knives as used in connection with the lickerin are for the purpose of scraping off leaf and dirt from the fibres, as well as for regulating the quantity of fly made. The nearer they are set to the lickerin without touching the teeth, the greater will be their scraping action and the smaller the amount of fly. The knives can be adjusted along with the dish feed plate. The depth of a mote knife is about 2½ in., whereas the thickness is about ½ in. It is not uniform throughout, but tapers to a knife edge from about half the depth. The angle at which the knives are disposed is important, since upon it depends the taking out of the maximum amount of impurities accompanied by as few good fibres as possible.

The undercasing is generally set as close as possible, without touching the lickerin teeth, to avoid the emission of much fly. Where no undercasing is used, a large quantity of fly is made, some of which contains a large percentage of good cotton, but the yarn is cleaner and better in this case. By examining the fly made under the lickerin the character of the setting of the feed plate to lickerin is indicated and when quantities of good fibres are found in the fly, better results with less waste would be obtained by a closer setting. If the setting is correct, the lap, when turned back from under the feed roller, will show the fibres composing the extreme end of it to be combed out and comparatively speaking, clean.

The setting of the lickerin to the cylinder may be made with the five or seven gauge (.005 to .007 inch), preferably the latter size, which should be drawn along without much pressure being required to move it. In setting, the bolts in the lickerin pedestals should be first loosened, and the latter then set with the screws and nuts provided for the purpose and fixed on the frame of the machine. By loosening the pedestal bolts stretching or springing of the setting screw is avoided and a truer setting obtained. The nuts should all be tightly screwed up to prevent a tight lickerin or doffer driving strap from pulling the lickerin teeth into those of the cylinder which would have a very bad effect upon the latter.

Setting of the Flats.

The cylinder takes the cotton from the lickerin on account of its higher speed and carries it under the action of the flats, whose work is to comb, parallelize, and remove short fibres. This is accomplished by the points of the clothing of the flats being inclined in the opposite direction to those of the cylinder. The wire clothing of the flats is ground so as to produce very fine striations, or small channels, which catch and retain the fibres which are to be drawn through the wires of the flats. On examination of a flat, it will be found that the back edge is ground a little deeper (shorter) than the front edge. This is called the "heel" to the flat. The amount of heel for a flat about 1½ in., is about 0.03. The object in having the heel is to ensure the fibres coming gradually in contact with the flats and not collecting at the back of the flats. This heel shape is first formed on the flat by grinding