

intermittent motion to the front rollers, and as the major portion of rollers, when a tooth is removed from the gear of the front roller its drawn power is stopped for a space of time long enough to form a thick place in the yarn. That is but a natural consequence, as the other lines of rollers are constantly delivering roving, and the temporary check imparted to the front rollers by the removal of a single tooth is sufficient to allow a certain thickness to pass without attenuation. As this intermittent motion of the rollers occurs at least once during each revolution of the rollers, so a bug or thick place will occur at regular intervals. As the twist in yarn has a tendency to run into the thin places the bug or thick places contain less twist than the thin places, and will consequently be softer to the feel.

In colored work a variety of effects can be obtained by twisting a bug thread of one color with an ordinary thread of another color. If a black and a white thread are twisted together, they produce a blended effect of spots of black and white. A black and a blue thread, when twisted together, give a blend that is hard to describe. A great variety of effect can be obtained if three threads, each of a different color, are twisted together. When bug yarn is to be used for warps it is more economical to twist the bug threads with an ordinary thread, as it adds strength to the bug threads, and enables them to be woven with less breakage than when used alone. For filling twisting with other threads is not so important for strength as the filling is subjected to less strain than the warp yarn.

A number of fancy twist filling yarns are produced by twisting various sizes and colors of threads together at different tensions. These yarns are variously called "corkscrew," "snake," and "chain" twists. The simplest one is the corkscrew twist, which is produced by twisting two or three threads of ordinary yarn together under different tensions. One of the threads forms the core of twist, and the tension on that thread is the ordinary tension used in twisting. If only two threads are to be twisted together, the second thread has less tension than the core thread, and as a consequence it twists around the core. A third thread may be added and twisted with the same tension as the second thread.

Snake yarn consists of two or three threads twisted together under different tensions. The core thread is run under the ordinary tension, while the second has a little less tension, which allows it to twist around the core thread, while the third thread has less tension than the second thread, and is twisted around the other two. In addition to twisting around the other two, a device in the twisting frame curls it around the other two in loop form at regular intervals. The chain twist is also composed of three threads twisted together, one of which forms the core, the other two being twisted around it so as to form links like a chain.

These twists may be of one color and material, or they may be of different materials and colors. Silk, worsted and cotton threads each of a different color are twisted together to form the corkscrew, snake and chain twists, and this combination of materials produces some handsome effects when the colors selected are those that blend harmoniously.

In weaving it is of great importance that the filling twist should be of a different hand from the warp twist if the fabric is to have the best appearance possible, and this holds good for not only worsted and woolen weaving of fabrics in which the face of the goods is not finished with a nap or pile, but also in cotton weaving. When the twists are of different hands, the yarn lies closer in the interlacing, and gives the fabrics a finer and more finished appearance than when the twist runs the same way in both filling and warp. In colored fabrics this is especially noticeable, and more noticeable in woolen than in cotton or worsted fabrics. With the same design, the same

material and colors, a right and left-hand twist for filling and warp produces a better looking and better feeling fabric than the fabric woven with warp and filling of the same direction of twist. When any of the fancy twists are used to a large extent in a fabric, the lack of a finished appearance due to using warp and filling of the same twist is not so noticeable as when ordinary filling is used, except in the colors.

When the twist runs in opposite directions the colors appear brighter than when the twist runs in the same direction in both warp and filling. Fancy twists are largely used in men's wear and in cotton dress goods. When bug, snake, corkscrew and chain twists are made of woolen or worsted threads combined with silk or mercerized cotton, and woven in cotton dress goods, it gives them a richer and more costly appearance than can be attained by any other means. In honeycomb effect for dress goods, any of the above twists will be composed of part woolen or worsted and used to form the ridges of the comb gives the fabric an appearance of being wool. The prominence that the wool thread is thrown into by being used to form the raised surface of the fabric attracts the attention to it that it would not otherwise receive. When a proper blending of colors is used in the construction of the twist, this effect is further increased.—American Wool and Cotton Reporter.

THE ARTIFICIAL INDIGO AND ANILINE DYES INDUSTRY.

In a recent report to the Foreign Office the British Consul at Frankfort-on-Main, after referring to the fact that the production of natural vegetable indigo at present equals in value the entire world's production of artificial dyestuffs, said that the present artificial indigo of commerce represents almost pure indigotin. It is sold in the form of a 97 per cent. powder, whereas the indigotin contained in vegetable indigo fluctuates between 70 to 80 per cent. It contains no indigo red, no indigo brown, and no indigo blue. The lack of indigo red and indigo blue, which both seem to be of some importance in the relation of the dyestuff to the fiber are its special disadvantages. The indigo red seems to be of importance in the production of darker shades of color. There is no doubt that at some time not too far off it will be possible to produce this ingredient also. Artificial indigo is used by dyers in the same way as vegetable indigo. If it is possible to render the process of manufacture materially cheaper and thereby to considerably reduce the price of artificial indigo, the danger to natural indigo will be greatly increased; it is, indeed, to be feared that with the increase of chemical knowledge the same fate awaits this dyeing plant, which is extensively cultivated in British territories, as overtook the Krapp plant, the cultivation of which now-a-days no longer pays.

Artificial indigo affords a new example of the manner in which applied science interferes in, and revolutionizes the most varied spheres and destroys as well as creates great wealth. In the territories in which natural indigo is grown, the intensity and magnitude of the danger which lies in the advance of the artificial product ought not for a moment to be disregarded. The struggle between artificial and natural indigo has already commenced. The latter still shows some advantages inasmuch as its by-products, such as indigo blue, indigo red, etc., aid the dyeing process to some extent. If natural indigo is to retain its position, every effort must be directed towards the organization of its culture, towards the manner in which it is collected, and towards the way in which the dye is shipped. In order to obtain a favorable result the ablest experts should co-operate in this important task, for to-day the fate of East Indian indigo culture lies unfortunately in the retorts of the chemical factories. As far as the price is concerned, the manufacturers of the artificial article so far follow the plan of always keeping it a fraction