

quantity of children's ribbed hose, fashioned and with straight legs, are made. In many homes knitting machines may be seen at work, making coarse cotton and wool goods for the German home trade. Counting large and small establishments, there are about thirty concerns in Gelenau employed on hosiery. Walking over the hills to the north-west, an hour sees us at Burkhardtsdorf, the great centre of coarse 27 gauge goods. There are nearly forty concerns all making nearly the same goods here. The bulk of the production is 13 single hose, better goods of 1-12's, 2-24's, 2-22's, and 2-20's yarn being in a small proportion. Previous to the introduction of the McKinley bill in the United States, the 13 single stocking was rarely made, but after this, it became the staple article in coarse gauge goods owing to its cheapness. Before the high tariff, Chemnitz houses paid the village maker 2s. to 2s. 2d. per doz. for making these goods, but to-day 1s. 1d. is the usual price, and in slack times they have been obtained for 10d. Nearly all the goods used for fleecing purposes are made in this place.

A beautiful road through the pine forests to the north-east leads to Dittersdorf, where there is a large factory making shirts and pants. There are three hosiery factories as well, with an assorted plant of 27 gauge and 33 gauge machines, for both hose and half-hose. On the top of a lofty hill, about due west, the little village Eibenberg is perched. It has three small factories making 27, 30 and 33 gauge hose and half-hose. It will, probably, never boast of any great importance owing to its awkward situation, and the natural difficulties opposed to an extensive intercourse with other localities. In the valley to the north, Berbisdorf lies, more favorably situated. Several factories have sprung up here in recent years. They contain Cotton's and Paget's machines, 27, 30, 33 and 36 gauge, and besides cotton work a considerable quantity of cashmere yarn. A little to the north-east, we get to Einsiedel, and are once more within an hour-and-a-half's walk of Chemnitz. Of about ten factories, the more important are owned by large Chemnitz firms, who have removed their machinery there for the sake of economy. The other concerns make all kinds of goods, plain 27, 30, and 36 gauge hose and half-hose, shirts and pants, and coarse worsted knit goods for the German home trade. The road back to Chemnitz passes through Erfenschlag and Altchemnitz. In the former village there are five factories, two of chief importance, making 27 gauge and 36 gauge plain goods respectively. In the latter place there are three concerns, making an assorted stock of plain goods, and six small establishments are devoted to knit wares. We have now arrived at the end of our journey touching the large group, south and south-west of Chemnitz. In the next number we shall take our readers to the places devoted to hosiery in the west, north and east. This is not so large a group as the last, but has great interest as comprising the homes of high fancy goods, lace goods, Swiss underwear and gloves, and many other industries intimately related to the hosiery trade.—*Knitter's Circular*.

### FIXING OF DIAMINE COLORS WITH METALLIC SALTS.

(Translated from the *Berliner Farber Zeitung*.)

The fixing of direct colors on to the cotton fibre, absolutely fast to washing, is one of the principal yet incompletely solved problems of cotton dyeing. Partial solution of this difficulty was no doubt arrived at by the introduction of such colors as were suitable for diazotising and developing on the fibre, a treatment by which also a substantial increase in the depth of the shade is obtained. The number of these colors is not yet sufficiently large, however, to make it possible to obtain that great variety of fast shades which the trade requires. The diazotising and developing process is limited to the production of certain standard shades such as red, yellow, orange, blue, blue-black, black and brown, where it serves its purpose in no small degree.

The ordinary and well-known methods of fixing colors by a previous mordanting of the cotton, etc., lead to abortive results when applied to direct cotton colors. With one or two of them, for instance with Diamine Fast Red F, dyeings on chrome mordanted cotton show a superior fastness to washing, but the tendency to bleeding on to the white is hardly less than if they had been

died by the usual methods. The better way of fixing is by treatment of the cotton dyed with Diamine colors with metallic salts. The results obtained by this method are, however, not quite satisfactory in every case.

This method of fixing the direct cotton colors is a subject of a patent granted to the *Farbenfabriken vorm. Friedr. Bayer & Co.*, who apply it to their Benzo Azurine. The patent is an outcome of the observation that certain color derivatives of the diamidodiphenol-ethers, like Benzo Azurine G and 3G, Heliotrope, etc., can be fixed so as to be fast to washing by means of the salts of copper, zinc or nickel.

The English patent No. 15,326-93 of the *Farbwerke vorm. Meister, Lucius and Bruning*, reveals to us the applicability of the above process extended to the use of chrome compounds, to a larger range of such direct colors which contain salicylic, o and m cresotinic, oxynaphtic and 1.8 dioxynaphthalene mono and disulphonic acid; all the salts of chromium oxide are applicable as fixing agents, but it is said that the basic chloride of chromium is especially adapted for the purpose.

The possibility of fixing cotton dyeings of direct colors with chromium compounds, viz.: chromium fluoride, which is by no means inferior to the chromium chloride, but at least its equal, has been recommended discriminately to their customers by Messrs. Leopold Cassella & Co. since January, 1892, in connection with their diamine Fast Red F and Diamine Bronze G. It is not deemed necessary to make the process public and to recommend it generally, because, if it improved the fastness, it did not make it absolute.

Another obstacle which must be taken into account and is the principal difficulty in the fixing of direct colors on the cotton fibre is the incontrovertible fact that it is easier to fix the dyestuff than to overcome its strong affinity to the same. Traces of color, minute particles, which bleed off the dyed on to the white cotton when scoured together suffice to condemn whole dyeing. It is therefore quite evident that the saddening of the dyeings with chromium compounds is only advantageous in some isolated cases, in the dyeing of cotton warps intended for weaving plushes, for instance, with Diamine Fast Red F, the saddened dyeings of which have been found to be an excellent substitute for warps dyed with camwood.

Besides the two methods of fixing the color derivatives of dianisidine with salts of copper, and the colors forming chromium compounds by saddening with chromium salts, there is another important process which applies to a new group of direct dyeing colors. It refers to two colors recently issued by Messrs. Leopold Cassella & Co., Diamine Jet Black OO and Diamine Jet Black SS. In their dyeing properties they behave in an absolutely similar manner to the well-known direct cotton colors. They dye not unlike Oxydiamine Black N, a full black in one dip, but from this and other similar products they distinguish themselves by their extraordinary fastness to light.

Dyed direct they show the usual fastness of such colors to washing, but if the dyeings be chromed for a few minutes only in a boiling solution of bichrome, perfect fixing results. This reaction is evidently an oxydizing process; for the same effect with more or less alteration of shade can be obtained with the most diverse oxydizing agents, such as sulphate of copper, ferric chloride, ferri-cyanides of alkalis, and the fixing is better the stronger the effect of oxydation. In a similar—but not in equally as perfect—a way, treatment with bichrome influences dyeings of Diamine Brown M and B, for which colors the saddening with a mixture of bichrome and blue vitriol has proved most advantageous. We now specify the different Diamine colors which show a decided improvement on being fixed after dyeing.

**I. Treatment with sulphate of copper.**—This may be done by passing the goods after dyeing through a solution containing 3 to 5 per cent. of their weight of sulphate of copper, according to depth of shade required, at a temperature between 170 deg. F. and boiling point, for between a quarter and half hour. With piece goods this can be done on a sloppad. This method shows good effect with Diamine Brilliant Blue G, which is a derivative of dianisidine and is a color