

this year the capacity amounts to 48,246 looms and 1,426,245 spindles. The consumption of raw silk is 11,000,000 lbs. per year, or about the same quantity as France consumes. But here comes in the difference in the results of French skill, that, whereas, the manufactured products of United States looms are worth a total of \$8,000,000, those of France are worth \$12,000,000. In other words, the superior skill of French silk manufacturer takes the same quantity of raw material and makes it 50 per cent. more valuable when finished. Franklin Allen, secretary of the American Silk Association, attributes this to the results of French art and technical schools. While no systematic efforts appear to be made to revive the once thriving, but now decaying, silk industry of England, the United States silk trade appears to develop through the combined results of protective tariffs and the invention of high class machinery. While Switzerland was using hand looms, the Americans adopted power mills, and the exports from Switzerland to the United States dropped one-half. In St. Etienne the use of hand looms was continued for its ribbon industry until it discovered, a decade ago, that the City Council must put in electric motors in order to meet the competition due to the increase of ribbon manufacture in the United States. France, which once furnished America with one-half of its consumption of silk, has found its markets lost by the development of American industry. It is the opinion of one writer that if the silk manufacturers of the United States improve their designs, before another ten years they will be exporting silk to every country in the world.

—American Consul Hughes, of Coburg, Germany, calls attention to Professor Koechlin's method for the bleaching of cotton and other vegetable fibers by passing them through a bath of 100 litres (26.4 gals.) of water, 10 kilogs (22 lbs.) of lime, and 50 kilogs. (110 lbs.) of bisulphite of soda. They are then steamed for an hour or two under a pressure of from one to two atmospheres, rinsed again, and dried. The bisulphite can be replaced by hydrosulphite of lime. The cotton or other fiber may be boiled in the bath for a few hours instead of being steamed. Another process is to subject the goods for six hours under a pressure of two-thirds of an atmosphere to a liquid composed of 1,000 litres (264 gals.) of water, 10 kilogs. of dry caustic soda, 10 kilogs. of soap, 1 kilog. (2.2 lb.) of calcined magnesia, and 30 litres (7.9 gals.) of peroxide of hydrogen; then rinse, souse, rinse again, and dry. The white obtained is said to be much better than can be had with hypochlorite, and, best of all, does no damage to the fibers or fabric.

Warner & Son, Alvinston, Ont., are putting in another broad loom into their woolen mill.

## FINISHING AGENTS.

In the production of textile fabrics a great variety of demands are made upon the finisher. All sorts of quantities are required, and every degree of appearance and feel is at different times necessary. It is sometimes even required to take one kind of a textile fiber and treat it in such a way that it will have the appearance and feel of an entirely different fiber. Experiment and constant investigation are always revealing new methods and new results that may be obtained by old methods, so that the finisher must always be conversant with the various materials that are employed in this class of manipulation, and must know somewhat the result of their action on different fibers and in different kinds of fabrics. It is quite evident that to understand thoroughly the action and effect which these many materials bring about in their use, is no small or trifling accomplishment, and if we were to attempt a full and explicit description of all these materials and their various actions on different fibers under different conditions, it would take us far beyond our limit, writes Textile in the American Wool and Cotton Reporter. But a few of the more important and more commonly employed may be mentioned. Certain of these agents are absolutely essential, and a knowledge of their use is indispensable to good work.

The Starches.—Perhaps the most ordinary class of such materials is the starches that are employed on various kinds of textiles and in various details of the process of operation. There are several kinds of starches that may be mentioned; potato, corn, wheat, etc. It is the character of potato starch to give a distinctly hard feel to the fabric, and since potato starch contains a very considerable proportion of gluten in its make-up, it is quite common to use it in connection with China clay, as a material for filling purposes. In any class of fabric where considerable stiffness is required, together with a good, permanent solid finish, potato starch is the material selected. Corn starch acts in a similar method, but not so vigorously or so satisfactorily, and can never give the same results, but on goods where a slightly lighter finish is required, the corn starch will serve the purpose. The wheat starch gives a pleasant, full finish, rather milder in its character and stiffness than either potato or corn. Another grade of starches that are sometimes employed are those such as dextrine, syrup and glue, but these materials are not so common as those formerly mentioned. China clay, as was hinted above, is made to act as a filler for light goods that are expected to weigh heavy, and is depended upon to produce weight and body rather than stiffness. Another demand sometimes enters in, in connection with that of stiffness and hardness of feel. It is quite frequently necessary to finish goods with a certain amount of lustre, as well as hardness, and the rough feel which is the result of the use of China clay and starches alone. In order to bring about this lustre, animal fats must be employed in connection with the other agents. The most ordinarily used for this purpose are perhaps tallow and lard, then the oils, such as palm, cocoanut, bees-wax, paraffine and magnesium chloride. When tallow is used, the result, that is, the required lustre, varies according to the way in which the tallow is employed, and the feel of the goods is at the same time made less hard and harsh. Palm oil has the effect of producing perhaps a milder finish than the tallow and may be used either bleached or unbleached. The lustre which is effected, is of a mild, agreeable and lasting kind. When using cocoanut oil, the appearance produced will perhaps not vary noticeably from the palm oil result, but the difference is, that a larger amount of cocoanut oil is required to do the same amount of work. One of the most difficult materials to use with sure and satisfactory results is lard. The finish which is