hypochlorite in solution, combinations of sodium hypochlorite and lime salt, etc.

Antiseptics:—During warm weather, or when the size is allowed to stand for any great length of time, there is a tendency for the same to putrefy.

Corn starch enjoys the distinction of retaining its freshness longer than any other starch, but for the purpose of preventing fungoid growths, without deteriorating the sizing properties of the ingredients, an antiseptic must be added.

These antiseptics often times serve a double purpose, such as the metal chlorides which serve as antiseptics as well as give weight to the yarn. The most frequently used are:—zinc chloride, magnesium chloride and calcium chloride.

Of these, zinc chloride possesses the greatest antiseptic property, while all are deliquescents.

Calcium chloride as well as *sodium chloride* are under certain conditions distinctly harmful, and it is ventured that the best results are obtained when both are entirely eliminated.

ZINC CHLORIDE being used to the greatest extent, it may be interesting to know that it is placed on the market in two forms, liquid and solid, and is prepared by dissolving zinc in muriatic acid, and as there is always some little free acid present, this is neutralized by means of soda ash; the slight trace of iron that may be present is precipitated out, the liquor allowed to settle, then run off into vats to age. It is a pale yellow liquid; its color should only show slightly by transmitted light. It should be perfectly free from iron and free acid. It is precipitated in the form on an oxychloride when water is added to it, and the white turbidity or milkiness is redissolved in excess of the chloride of zinc. It attacks iron with great rapidity, and should never be allowed to come in contact with that metal, as it at once begins to take it in solution. The liquid is often of 49° *B.*, or of a specific gravity 1.51, or a gallon weighs 15 $\frac{1}{10}$ lbs. At this strength, it should contain from 44 to 45 per cent of pure zinc chloride. It is liable to adulteration, the chief adulterant being common salt. The solid form is simply the liquid form evaporated down until the solution attains a temperature at which the percentage of the zinc chloride is a constant, when it is then packed in lead lined casks and hermetically sealed. At the destination, the stuff is dissolved in water and made to a convenient strength.

As zinc chloride is seldom pure, it should be tested for the presence of:—salt or sodium chloride, which, if present, will, upon combination with equal parts of strong hydrochloric acid, be precipitated in small white crystals.

Iron salts may be detected by adding one drop of the zinc chloride to a solution of potassium sulphocyanide which has been boiled with a little pure nitric acid for a few minutes.

If the resulting solution assumes a blood red color, it is an indication that iron is present.

The amount of *free acid* is quickly determined by the use of litmus paper, the presence of the same turning the blue paper red immediately. This test must be instantaneous, as zinc chloride itself would have the same action on the litmus paper, the only difference being that it would require a greater length of time than if free acids were present.

FORMALDEHYDE or formalin for all ordinary sizing of goods exposed to normal conditions, is entirely adaptable, and when used in dilute solution, forms an extremely good antiseptic. Care must be observed, however, to use precaution in preparing the solution, not to have the strength too strong, as there is a tendency to harden the fabric somewhat after the nature of tanning.

CARBOLIC ACID or phenol, while it has antiseptic properties, its use, from a financial standpoint, proves almost prohibitive in an extensive way in sizing. It being a coal tar product, it is suggested that a pure quality be used, and that it be as free as possible from certain coal tar products, or it may result in stains to the fabric. Crude carbolic, while it is a most efficient antiseptic, is almost prohibitive for use in size, due to the characteristic odor which is somewhat disagreeable.

(*To be continued.*)

CHRONOLOGICAL EVENTS IN THE TEXTILE INDUSTRY.

(*Continued from page 46.*)

1606. The manufacture of carpets started at Chaillot, France.

1608. The culture of the silk worm attempted for the first time in England.

1610. Fixed sinkers added to the stocking frame by Aston, thus doubling its capacity.

William Lee, the inventor of the stocking frame, died broken-hearted, in poverty, in France.

1614. Dyeing wool before spinning, first practiced in England.

1619. Tapestry weaving started in England, at Mortlake.

1620. The manufacture of broad silks started in England.

1621. This year is generally regarded as the birth-year of cotton culture in the United States. A tract called "A Declaration of the State of Virginia," published in London in 1620, mentions cotton wool as one of the commodities of that "collony." In 1621 cotton wool was 8*d.* per pound in Virginia.

1629. The Silk-Throwsters' Company of London, England, incorporated; a Mr. Burlamach, a London merchant, having a few years previously introduced silk-throwing on a considerable scale.

1630. The Saxony, or Leipsic wheel, with bobbin and flyer, invented.

1631. The Company of Silkmen incorporated in London, England.

The first shipment of calicoes brought to England, from Calicut, India.

1638. About twenty families from Yorkshire, England, settled at Rowley, Mass., and established the manufacture of cloth. Here they built the first fulling mill, said to have been erected by John Pearson, in 1643, and is claimed was in operation so late as 1809. It then contained a cedar tenter-

post brought by them from England, which remained perfectly sound. The second fulling-mill was built at Watertown, Mass., in 1662.

1646 The manufacture of fine woolens established in France by Mazarin.

1650. The manufacture of lace started in Buckinghamshire, England.

1657. The Stocking Weavers' Company of London, England, incorporated.

1664. Colbert, the celebrated minister of France, established a carpet factory at Beauvais; he also encouraged lace manufacture.

1666. To foster woolen manufacturing in England, Parliament passed an act that all persons were to be buried in garments of woolens.

1667. The French Government, under Colbert, in the reign of Francis I., bought the carpet and tapestry factory of Gobelins folly, built by two brothers, Giles and John Gobelin; its name was changed to Hotel Royal des Gobelins. It has remained the most prominent factory of its kind in the world, ever since.

1671. Edmund Blood obtained a patent in England, for carding, spinning and weaving waste silk; the first attempt to spin waste silk similar to cotton spinning.

1676. Calico-printing started in London in a very crude manner.

The ribbon loom as invented in 1589 in Holland, introduced into London.

1678. M. De Gennes presented his model of a machine for making woolen cloths without the aid of a workman, to the Royal Academy of France.

1685. Revocation of the Edict of Nantes, by which 800,000 of the artisan population of France were driven from that country, compelled to find refuge in Prussia, Holland, England and other Protestant States, in turn introducing to these countries many arts then unknown there. The most important event to England in establishing its industrial arts on a solid footing, was the coming of 70,000 of these educated artisans to that country, many of these Huguenots being experienced textile workers.

The first calendering machine used in England.

1686. Abraham Opdengrafe, claimed from the Governor of the State of Pennsylvania the premium offered to him who should make the first and finest piece of linen cloth.

Velvet weaving introduced in Spitalfields, England.

1687. First attempt of spinning by machinery, in England, by Dereham and Haines.

Joseph Mason, an Englishman, obtained in that country a patent for an engine (loom), by the help of which the weaver may do without the assistance of a draught boy.

1696. Calico printing introduced successfully into England.

1698. Francis Pousset obtained in England a patent for the true art of making black and white silk crapé.

1700. The wearing of cotton goods forbidden in England.

1708. A spinning school established in Ireland.

1716. The manufacture of Paisley sewing thread begun by Christian Shaw of Barrgarran, Renfrewshire, Scotland.

1718. Silk throwing established at Derby, England, by Thomas Lombe; the beginning of the modern factory system in that country.

1721. By an act of Parliament, England imposed a fine of £5 ($25.—) on the wearer and a fine of £20 ($100.) on the vender of cotton goods.

1725. M. Bouchon invented in France the application of perforated paper for working the drawloom; from it, and the inventions of M. Falcon (1728) and Vancanson (1746), Jacquard, in later years, obtained the idea for his invention of the machine that makes his name memorable.

1728. M. Falcon, a French mechanic, substituted a chain of cards to turn on a prism or cylinder, in lieu of the paper band of M. Bouchon (previously referred to).

1730. John Wyatt, an Englishman, then living at a village near Lichfield, first conceived the plan of spinning by means of rollers.

The first cotton stockings woven.

1733. The fly shuttle invented by John Kay of Bury, England; he also substituted brass wires for the canes in the dents of the reeds, then in use.

John Wyatt constructed a model about two feet square, by means of which, in a small building at Sutton, Coldfield, England, without a single witness to the performance, was spun the first thread of cotton ever produced without the intervention of the human fingers. The fibres had been carded the common way, and were passed between two cylinders, from whence the bobbin drew them by means of the turit.

1734. Cotton was planted in Georgia.

1738. A patent was granted to Lewis Paul, a partner of John Wyatt, for spinning by rollers. Wyatt is supposed to have been the inventor, and Paul to have supplied the capital required.

1740. The tuck pressure, an instrument for gathering the loops, an improvement upon the stocking frame, introduced from Ireland into England.

(*To be continued.*)

DIRECTORY OF TRADE MARKS RELATING TO THE TEXTILE INDUSTRY.

Registered February, 1911.

1. Wearing Apparel.—Wise Bros., New York City.

2. Ladies' Wearing Apparel.—Saul Brener, Boston, Mass.

3. Twine and Cord.—The Wm. J. Hooper Mfg. Co., Baltimore, Md.

4. Woven and Knitted Wearing Apparel.—Syracuse Dry Goods Co., Syracuse, N. Y.

5. Hosiery.—Syracuse Dry Goods Co., Syracuse, N. Y.

6. Loom Supplies.—Garland Mfg. Co., Saco, Me.

7. Linen and Damask Goods.—Joseph Mathers, Ltd., Belfast, Ireland.

8. Men's Wearing Apparel.—The Southern Overall Co., Baltimore, Md.

9. Men's Wearing Apparel.—American Clothing Mfg. Co., Baltimore, Md.

10. Alpacas, Velvets, Cottons, Velveteens and Serges in the Piece.—Kraus, Lambert & Co., New York City.