

**Spinning, n. (Manuf.)** The art of combining animal and vegetable fibres into continuous threads fit for the processes of weaving, sewing, or rope-making. If wool or cotton is to be spun, it has at first to be "opened;" that is, it must be relieved from its original knotted and lumpy condition; this was formerly done by hand, but is now easily managed by machines called *willocks* or *willeys*, *blowers*, and *openers*. By the first of these, which consists of a drum covered with small spikes moving in a hollow cylinder, also lined with spikes, but so arranged that those on the drum pass close to, but do not come into collision with, them as it revolves, the cotton or wool is fed in on one side, is dragged forward by catching on the spikes, and is delivered at an opposite opening to that by which it entered, in a loose state and free from knots. It is not, however, quite loose enough for the subsequent operations, and it is more or less mingled with impurities. It is therefore taken to the "blower" or "opener," and being put into a shaft, is there acted upon by a stream of air violently driven in by machinery, which blows it forward, removes extraneous matters, and so separates the fibres that they pass out at the other end in an exceedingly light flocculent state, and ready for being formed into *laps*. This operation consists in laying the material very equally on an endless apron made of small bars of wood, and of the width of the frame of the machine in which they are placed. This apron passes round two rollers, placed at a little distance apart, the rollers being moved by machinery. The arrows indicate the direction in which the apron moves; and as the operator covers its entire surface with a thin layer of the fibre, it passes successively under the two rollers, and comes out in the form of a compressed layer of cotton or wool, called a *lap*. The laps are taken to the *carding-machine*, consisting of a series of cylinders revolving in a frame, and placed so close together that they almost touch each other. Each cylinder is covered with a coating of fine steel-wire points, which are stuck in leather, or some other flexible material, and are technically called *cards*. The lap is made of the same width as the cylinders of the carding-machine, and is so adjusted that, as it unwinds from its roller, it passes in between a pair of the carding cylinders, the steel-wire teeth of which seize hold of the individual fibres, and drag them in one direction until they are caught by other cylinders, and so carried from one to another, always being pulled in a straight direction, until they are laid as nearly as possible side by side, and are given off in a thin cobweb-like film at the last cylinder, where it is prevented from continuing its journey round the cylinders by a small bar of metal called the *doffer*, which, with a gentle and peculiar motion, removes it from the cylinder. The film of fibre is of the same width as the cylinder of the carding-machine, but it is gathered together by the operator, who passes it through a smooth metal ring, and between two small polished rollers, the revolutions of which carry it forward, and deposit it in a deep tin-can in the form of a loose untwisted column of cotton or wool, about an inch in thickness, which is called a *sliver*. If such a sliver or cord be firmly griped or compressed at two points rather farther apart than the average length of its component filaments, it may be extended or drawn out to a greater length, the filaments sliding upon each other. When two or more such cords have been extended in this way, until they will stretch no longer without separating or being pulled asunder, they may be laid parallel to each other, and combined by being slightly twisted together. The compound cord thus formed may be again extended by stretching or drawing; and the repetition of the processes of doubling, twisting, and stretching will enable the spinner to extend the length and diminish the thickness of the cord until it becomes a fine compact thread or yarn.—The primitive modes of *S.* by the spindle and distaff, and by the *spinning-wheel* (Fig. 2410), which are still extensively practised in the East, and not entirely superseded in some remote parts of this country, only enable the spinner to produce a single thread; but with the almost automatic spinning-machinery which has been called into existence by the cotton manufacture, one individual may produce nearly 2,000 threads at the same time. The history of the series of inventions by which this result has been gradually attained is briefly noticed under COTTON MANUFACTURE. The manufacture of yarns or threads of silk is a process essentially different from the *S.* of cotton, wool, or flax. Instead of combining a number of short fibres into a long thread, the silk-throwster receives the silk in the form of very long and exceedingly fine filaments, which merely need cleansing and twisting together until the requisite strength is attained. The twisting process is, in this case, called *S.* There is, however, besides the best portion of the silk, which is wound off from the cocoon, a quantity of loose or *floss* silk, which forms a soft tangled mass enveloping it. This, with the refuse of the superior part of the silk, under the general name of *waste*, is converted into yarns for coarse or inferior articles, by a process very similar to that of *S.* other fibrous substances. This waste silk was formerly cut by a machine, to reduce its filaments into short lengths, and then treated in much the same way as cotton-wool; but the process of manufacturing it into yarns has been recently much improved by the adoption of contrivances similar to those used in flax-*S.*, by which the filaments are heckled or drawn out into a sliver without being cut.