reduced in thickness, it receives a slight twisting, to enable it to hold together. This was formerly obtained by giving a rapid revolution to the receiving can e. See Roving; Drawing.

4. (Flax-manufacture.) The process with flax is similar to that described as pertaining to cotton.

In the first place, the sticks or bundles of handspun flax are spread on a traveling-apron and conducted to drawing-rollers, which bring the filaments to an attenuated sliver and deliver it into cans. The slivers, from a number of cans, from six to fifteen usually are next conducted to drawing-rollers, being thereby doubled and drawn; the process is repeated, as with cotton, until the sliver is equalized and reduced to the required degree. See Drawing.

5. (Silk-manufacture.) The twisting together of two or more filaments of twisted silk. This process follows the first spinning of the filaments of silk, and precedes the throwing, which is a further combining of threads and twisting them together. First, the twisted filaments; then the doubling, forming doubling-tubes; then the throwing, forming throw-strings.

The process of doubling silk differs from that of doubling cotton and flax, inasmuch as the silk filaments are continuous and cannot be drawn. The doubling of flax or cotton fibers is for the purpose of equalizing the thickness of slivers, and the drawing which accompanies each operation is for the purpose of lengthening the combined slivers so as to make an attenuated sliver. By this means any tripling irregularity in the thickness of a sliver is lost by causing it to coalesce with others and elongating the bunch; the process being repeated again and again, as may be necessary.

In the doubling of silk, as there is no re-attenuation by drawing, the number of filaments are combined into one thread of the aggregate thickness of the several filaments.

The bobbins of thread to be doubled are mounted on a small frame, and the ends, being collected, are passed through a loop and attached to a bobbin, upon which they are wound. The parallel threads are then transferred to a horizontal reel, from whence each set of combined threads is carried through the eye of a rotating flyer and wound upon a bobbin, the combined threads or strands being twisted into a cord. The latter operation is known as throwing.

The direction of the twist is varied for different qualities and varieties of silk goods.

In ordinary spinning of the silk filaments the twist is to the right.

For twist; the spinning of the filaments is omitted; when doubled, the thread is twisted to the right.

For organze the filament is twisted to the left, then doubled and twisted to the right.

The twisting of the thread is set or made permanent by exposure to steam.

Doubling.

3. (Cotton or Wool.) Bringing two or more slivers of fiber together and forming them into one of greater thickness, to be again reduced by drawing; thus obtaining a sliver of uniform thickness.

The slivers from the carding-machine, each in its separate can a e, are conducted between one pair of rollers b, which causes them to coalesce; then through a second pair c, revolving at an increased speed, which draws out and lengthens the sliver, and then through a third pair d, which still attenuates the sliver. The operation is repeated as often as may be necessary to correct every inequality in the thickness of the sliver.

The next process is roving, which is also performed by drawing-rollers; but as the sliver has become