objectionable than the other. But dishonest practices are unfortunately not confined to the description of silk above mentioned ; it is too common in all hanks to find some coarse inferior quality *of* silk artfully prepared with a cover- ing of a much liner kind, to enhance its value.

The loss of capital, which careless reeling, and the base practices we have alluded to, entail on the manufacturer, is immense ; for if an establishment be formed, with ma­chinery and workers sufficient to throw a given quantity of good silk ; take, for example, the Italian silk, called *Fos∙ sambrone,* which, of all the raw silks, is the easiest manu­factured, and if, in place of some of the *Fossombrone,* the machines and workers come to be employed on some silks vitiated as we have described, or reeled in a careless manner, then, from the foulness and unevenness of the thread, the number of workers will, in all probability, not be suf­ficient to attend to above one-third of the machines, one winder being able in a given time to wind five times as much of the *Fossombrone* as of some of the *Bengalese* silks.

From what we have said it may be inferred, that it is a matter of great difficulty for the manufacturer to determine the number of machines and workers in the various processes ; and that, from the ever varying nature of the silk, he will seldom have the whole of his machinery employed.

If the preparation of the raw silk, as reeled silk is termed, were conducted by persons conversant with the processes of the silk filature, who would adapt their mode of working to suit the various purposes to which the article prepared by them was to be applied ; or, if the whole of the operations were under the conduct of an instructed agent of the manufacturers, the evils on which we have animadverted would be removed, and a better and a cheaper article would be furnished to the consumer.

The operations which succeed the reeling are those of silk throwing, and are as follows :

1st, *Winding* the silk from the honks upon bobbins, to fit it for the further processes.

2d, *Cleaning,* consisting in the silk being unwound from the bobbins of the winding machine, and wound upon ano- ther set of bobbins ; and, in its passage between, made to pass through an opening between two metal plates, by which any inequality, caused by knots or adhering substances, is removed.

3d, *Spinning,* consisting in twisting the cleaned thread.

4th, *Doubling,* consisting in laying together on one bobbin the threads of several bobbins, so that they may be afterwards combined by being twisted together.

5th, *Throwing,* the name by which the operation of twisting the doubled silk is known, and also the name by which the whole class of operations is distinguished.

It has been conjectured, that the name *throwing* is de- rived from the swinging and tossing of the threads and cocoons while reeling, but we need not travel out of the way for its derivation, as the operation of twisting is in many other arts called throwing. The ropemaker *throws* twist into his ropes ; and the little instrument used in the farmyard for twisting straw ropes, is called a *throw-crook.*

6th, *Heeling,* consisting in forming into hanks suited for undergoing the processes of scouring, dyeing, and bleach- ing the silk which has undergone some or all of the pre- vious o∣>eratιons.

7th, After the scouring, bleaching, or dyeing processes have been performed on the hanks, these have again to be wound on bobbins, for the use of the warper or weaver.

It is not to be understood, that silk in every case undergoes all the operations we have mentioned, but that, when it does so, these succeed each other in the order described.

It is sometimes merely wound and cleaned, and is in this state under the name of dumb *singles,* used for Ban- dana handkerchiefs, and, when bleached, for gauze, and similar fabrics.

It may be wound, cleaned, and thrown, and is then called *thrown singles,* and used for ribbons and common silks.

If wound, cleaned, doubled, and thrown, which twists it into one direction, it is called *tram,* and is used tor the woof or shute of Gros de Naples, velvets, and flowered silks.

If wound, cleaned, spun, doubled, and then thrown, so as to be of the nature of twine, or the strand of a rope, it is call- ed *organzine,* which, from its strength, is used for warp.

Silk, in any of these states, before being subjected to the operation of scouring, is termed *hard,* but after it is by scouring deprived of its stiffening-gum, it is called *soft.*

The operations of the throwster are generally carried on in a building which admits of an apartment being allotted to each description of machines, and these apartments are generally in stories. All the machines used in the processes are each made up of a repetition of the same parts, each part being a distinct and separate apparatus, capable of performing its work independent of its fellows ; and these are arranged in juxtaposition in the *machine,* in order that the moving power may be conveniently applied to a long series of them. The length of the machines is regulated by the extent of the building, and the manner of their arrangement. A manner of arranging them is here sketched (fig. 2.) The apartment is supposed to be about thirty-eight feet wide, and

the machines are placed

athwart the room, so as to

afford a passage four feet

in width along the centre,

and at such a distance

lengthways, as to give

room for the workers to

attend to their charge. Two

shafts traverse each apartment in the direction of

the dotted lines, and carry

on them pullies, or toothed

wheels, opposite to each machine ; a belt from each pulley is carried over a corresponding pulley on the end of the main shaft of each machine, or the toothed wheels are con- nected by proper gearing with the shafts of the machines, and so motion is given to the whole.

The rooms are generally heated by steam, and the temperature of the apartments, when above the minimum of 50°, is regulated more by a regard to the health of the workers, than from any necessity for a particular temperature in the operations; but these cannot be performed with advantage when the temperature is allowed to fall below 50°.

The first machine or apparatus used is the winding-machine, or that by which the reeled hanks are wound on bobbins, to prepare them for the subsequent processes. A perspective sketch of this machine is shewn in fig. 3. Along