A MACHINE FOR WEIGHING OFF, AUTOMATICALLY, AN EXACT AMOUNT OF YARN.*

The object of the machine is to weigh off rapidly and with precision an exact predetermined amount of yarn and to wind it into balls or otherwise, into the form in which it is to be sold.

It consists essentially of a pair of scales, an apparatus for feeding the yarn on to the scale pan, an apparatus for stopping this feed at the proper time and a machine for winding the measured amount of yarn into a ball or any other desired form.

The yarn is placed in skeins, as it comes from the spinning machine, on to two reels or rollers above the machine. The thread passes loosely between a pair of smooth jaws like those of a vise, thence between a roller and an idle pulley resting on it, and finally into a light cylindrical box of tin, which is the scale pan of the weighing scales.

By means of a chain gearing and a large wheel, this roller is turned rapidly (by hand or by other power) and pulls the thread of yarn off the skein and into the box as long as the idle pulley rests against the roller. The tin box into which the yarn is thus fed is on one arm of a pair of scales, on the other arm of which is placed the required weight. On the weighted end of the scales there is a wire dipping into a mercury cup, thereby keeping an electrical circuit, from a battery or small dynamo, closed, as long as there is not the required amount of yarn on the pan. In this circuit there is a powerful electro-magnet, the armature of which is secured by levers to the idle pulley and vise jaws described above. As soon as the yarn, which is being fed on to the scale pan, is sufficient to counterbalance the weight on the other arm of the scales, the tilting of the scale beam opens the electric circuit at the mercury cup and thereby relieves the armature of the magnet, which in

* Exhibited by Mouchère, in the French Section, in Class 54 (Appliances and Methods of Spinning and Rope Making).

turn raises the idle pulley from the feed-roller, thereby stopping the feed and closes the vise jaws, which then hold the thread securely at the required point.

An empty scale pan is then put in place of the one which is full, and while the second quantity is thus being weighed off, the first is simultaneously wound into a ball by a simple winding apparatus attached to and operated by the same machine.

The success of the machine seems to be due to the fact that the weighing and the winding are not one and the same, but are two successive operations.

The precision with which the yarn can thus be weighed, depends evidently only on the sensitiveness of the balance used.

Instead of *opening* a circuit when the required weight is reached, the apparatus might be arranged to *close* a circuit, thus economizing current. But the latter would have the disadvantage, that should the current from any cause fail, it would not render itself evident, as in the reverse arrangement, in which, if the current fails, it stops the feed.

CARL HERING.

NATURAL HISTORY IN ELEMENTARY SCHOOLS.

BY DR. H. HENSOLDT,
School of Mines, Columbia College, New York.

[*A Lecture delivered before the FRANKLIN INSTITUTE, November 18, 1889.*]

Prof. PERSIFOR FRAZER introduced the Lecturer, who spoke as follows:

LADIES AND GENTLEMEN:

Another few weeks and we shall enter upon the last decade of this our nineteenth century, a century which will be forever memorable when it passes into history as one of progress unparalleled in the annals of the human race: for no matter to what heights the genius of the inventor or the daring of the scientist and philosopher may yet rise in the ages that are to come—the one in conquering