1 lea (or 300 yards) to the lb. The bobbin is filled with flax rove of 40 leas (or 12,000 yards) to the lb.

On the machines on which this bobbin and cop were filled only one expander is used, and the band is kept at the necessary tension either by making the expander swing in a frame or by the use of a stretching pulley.

A very simple mode of applying a stretching pulley is to make the pulley, which does not vary, with two grooves or V's, and pass the band twice round it, putting the expander in one fold, and the stretching pulley in the other. These arrangements are applicable to many other purposes. Where two expanders are used, one to drive the other, it is not necessary to have any stretching pulley, but simply to connect one or both sides of each pulley with levers, so that they may be moved simultaneously as required.—*British Association*, 1858.

Electro-zinc Deposits on Engraved Copperplates.* By HENRY BRADBURY.

M. Louis Figuier, of Paris, through the instrumentality of my friend and *confrère* M. Henri Plon, the eminent printer and publisher of Paris, having recently, in the columns of *La Presse* newspaper, made mention of my mode of surfacing engraved copperplates with a coating of pure zinc by electro-metallurgical means, for the purpose of protecting such plates from wear while printing, and which coating can be removed and renewed at pleasure with facility, and without injury to the engraved plate, I beg leave to introduce the particulars of my mode, for the benefit of those interested in extending the application of the galvano-plastic art.

To obtain a deposit of pure zinc capable of printing from 1500 to 2000 impressions, or more, before requiring to be removed and renewed, I have recourse to a combined solution of chloride and cyanide of zinc, prepared as follows:—

CHLORIDE OF ZINC SOLUTION.—In a suitable vessel dissolve one part chloride of ammonium in eight parts water; place in this a porous cell containing the same solution and a copperplate, which attach to the zinc of a Smee's battery, and in the outer cell place a plate of spelter, which attach to the silver of the above battery for 48 hours.

CYANIDE OF ZINC SOLUTION.—Dissolve $\frac{1}{2}$ lb. of cyanide of potassium in twelve parts of water; then add as much chloride of zinc as the solution will take up.

Mix these solutions together in equal parts; use a zinc positive pole and one of Smee's compound batteries, intensity arrangement, charged with one part of sulphuric acid to twelve of water.

In from 45 minutes to an hour a deposit of the most beautiful lustre will be obtained, capable of yielding from 1500 to 2000 impressions, and even more, according to the experience of the manipulator.

Whitefriars, February 3, 1869.

* From the Journal of the Society of Arts, No 324.