COVERING AND TWISTING MACHINE, AT THE VIENNA EXHIBITION.

CONSTRUCTED BY MR. G. STEIN, ENGINEER, BERLIN.

(For Description, see Page 360.)
TEXTILE INDUSTRY AT THE VIENNA EXHIBITION.—No. XII.

By Dr. H. Götze.

This machines for fringe-making at the Vienna Exhibition, represent multifarious constructions intended to fulfill the varied requirements of this branch of industry. Amongst these machines we find examples for making all kinds of cords, gimps, and trimmings, &c., some of these being entirely new and of highly interesting construction. Amongst these we may first mention the beautiful braiding machines for the manufacture of narrow bordered ribbons, of many threaded cords, of lace, gimps, &c. These little braiding machines are constructed generally in such a manner, that vertical bobbin holders, to which bobbins are fastened, are made to travel over ways cut into thin iron plates, the motion being produced by a series of toothed wheels, the teeth of which gear into the well turned body of the bobbin holders fastened under the plate, the bobbins being thus moved along the fixed ways. The ways and curves in which the bobbin holders are moved follow from the points of intersection. The moving of the bobbin holders producing considerable friction, and especially a pressure of the holders against the edges.
of the curves, various constructions have been tried, without removing entirely these disadvantages. For the French machines of this class, wooden wheels and levers are commonly used, and the bobbin is supplied from Bannen (the principal seat for the manufacture of these machines in Germany), have adopted finer and lighter wheels, but, however, even of hard ceduncle are at present being tried, as proposed by the pamphlet. Other manufacturers combine iron and wood wheels, and use few Australian and American machines, or garwood and wood, for this gearing.

A large number of these machines are exhibited in the Austrian and Swiss Institutions. To the latter belong the brading machines of Mr. Friedrich Diehl, of Baden. They are provided with a large number of wheels, and work well, although there is nothing especially new in their construction. They may be said of the excellence of machines exhibited by Mr. Amsel, of Vienna. In general, however, little attention is paid to improvements in the construction of these machines, and nothing has even been written or published about them, and for in particular the prettiest work turned out by textile industry.

Cords which require less care in their manufacture, or which are made in large quantities, are produced on larger machines, an excellently designed example of which is exhibited by Mr. G. Stein, of Berlin. These machines are carried on throughout the factory, when they are started and carried on until 1550 under the name of F. Haack. At these works only machines are made which are also used for the manufacture of all the different kinds of goods north and south of Germany, and in Russia, have been supplied with machines by Mr. Stein, of Berlin. The machine shown here is one of the best known in the market. The case is a machine in the case of the ordinary wheel, a quality of the Vienna Exhibition, and an improvement of which was published on the preceding page, Mr. Stein has made a new progress in this manufacture, for up to now cords of two, three, or four threads had always to be made with the ordinary hand wheel—mode of working which is much too expensive and inconvenient for the purposes which we have in mind. Our engraving shows this machine with all its details, and for the sake of clearingness the bobbin table and bobbin are shown in section.

Two iron frames A, connected by cross pieces B, carry upon the horizontal fixed table C four carriers, which are fastened upon plates D, and in which the rolls E for the roving thread are placed. The plates D are fixed upon the table C by means of pins, which carry pinions geared into a spur wheel F, this latter being driven from the shaft H by the bevel wheels G and G'. A suitably arranged compound roller S secures the cord the proper tension. At the opposite side to these rollers is placed a strong throwing spindle J, which is fastened in the proper position of the machine. The drum Z is placed, the speed of this drum being capable of being altered by fixing pulleys of different sizes at L, and the speed of the plates D may be regulated by altering the wheels at M. In this manner it is possible to alter both the motions just mentioned, but independently of each other. The carriage O, moved up and down by the lever, is used for winding the cord on the bobbin N. The course of the threads for the cord is shown on the engraving. If cords have to be made, the threads coming from the rollers E pass through the roller S, are carried around the drum Z, and thence over the roller T, through the guide U, which keeps the threads in place for 2mm. These two guide pieces are united threads are finally fastened to the throwing spindle J. The machine may be worked either by hand or by machinery, as desired.

The turning of the plates D and of the spindle J has the effect of causing the threads coming from D to move proportionally and in a more advanced line, and the advantage of being able to cut off the threads, when afterwards twisted by the spindle J, are worked up with each other more closely, making them more suitable for the use for which they are designed. This is a plate moving round one side like a side-sided lever; this plate is pressed firmly against the bobbin E by a pressure of 150 lbs., and the pressure corresponds always with the state of the winding off. For instance, if the bobbin is filled up to within 4 lbs., there is no action of the lever on account of the shape of the frame, and this circumstance, it being necessary that the length wound off at each revolution should remain constant, the window in its full state the brake plate presses harder against it, and thus prevents the running off of the thread. Every quantity of thread the bobbin contains the less the brake is pressed back, whence the bobbin is allowed to rotate more quickly, as required by the diminished circumference. The regulation of the winding is managed in this way very easily. The guide at U consists of a small plate of iron, in the circumference of which three or four semicircular grooves are cut, these forming, with the surrounding bush of iron, the guide which holds each of the threads to be spun is passed. The twisting of the threads has to take place, therefore, constantly within the distance of the bush, between the thread guide and the polyth, at the top of the spindle J, whence a guarantee for the uniformity of the thread is obtained.

Other kinds of machines for winding less expensive material with good material, as, for instance, by spinning silk over cotton. A machine of this kind, for covering the rods of whips, is to be seen at the Exhibition, but it is unfortunately not at work. Machines of this kind are called winding or covering machines, and the machines for covering telegraph wires, the pure winding machines, and the flower-binding machine for millinery work, exhibited by Mr. Amsel, of Vienna. Such machines are exhibited in the Austrian department by MM. Carl Arzt, Georg Hutter, Carl Mühler, From Schonbrunner and Franz Hartmann, all of Vienna. These exhibited machines, however, are all constructed on well-known and old principles, and it is not worth while to say any more about them here, with the exception of what is being shown here, that is describing the disengaging gear for bobbin and roller, and the arrangement of it adopted by Mr. Hutter. The annexed sketch shows the construction formerly, and even now often, adopted for such machines, although it works slowly.

The hollow shaft carries the rope polyth, for receiving the motion and the roller b b for the material to be used for winding or covering the thread of this material passes from this roller through the eyes d and e, and is then fastened to the cord of cotton or string, which comes over the shaft f, and is then wound round the rope polyth, which then is passing slowly through the hollow shaft, the guide g, and the guide h, and with the eyes d the better material from the roving frame d and the guidance of the great wheel polyth, according to the difference of the speed between the rotation of the roller and the travel of the thread. It is very easy to understand that this kind of covering arrangement could not do much work, although some of these machines are provided with between twenty and thirty of such tubes. In order to facilitate and increase this work, and in order to add a saving material, Mr. G. Stein, of Berlin, has constructed a suitable machine, the design of which is based upon the principle of covering the ground with material at once with from eight to fifteen threads, which are arranged and stretched side by side, whence the work produced is very much increased.

This machine, which has been daily at work at the Vienna Exhibition, and which, as our engraving on page 358, may also be used, if not for winding or spinning, as a simple doubling or twisting machine.

As will be seen from our engraving, N is the table upon which the rollers with the material are placed. The loom is not like the advanced state of the machine, it being in groundwork of the cord pass over one of the steps of the roller T, then over the roller K, along the guide L, and then over the guide m, and finally to two bohings G. The latter are placed upon the bobbin table H, whilst the spiders pass through it, and are covered with the roller S, as shown in the figure, and the shaft C, which receives its motion from the pulleys F F. The upward and downward travel of the roller S, which are formed of wheels D and E, which are fixed to the frame A. In this manner the machine works if used for twisting or doubling. If used for winding or covering, however, the material adopted for this purpose is passed through the small guides of the guide-plate M, the threads then being passed from eight to fifteen threads each, over the distributing plate N, and finally to the spider, which is indicated in the engraving in a simple manner only, which is not the case of a complicated construction. Each hook O arranges the threads to be wound separately on a pin, which are composed by the other in a plane, in which position they come in contact with the material, which surround them as the latter rotates. A great advantage of this machine is that each spindle works independently of the other, and that various speeds can be given to the corresponding bands. Indeed, whilst each spindle can be stopped without interfering with the motion of the others, whence various kinds of cloth can thus be done simultaneously on this machine. We should mention here that Mr. J. Stein, of Berlin, exhibits also a machine for the covering or buttoning the work. We have not to speak about the embossing machines exhibited at Vienna. We find at the exhibition considerable with weaving machines a number of small appliances, which may be considered as embossing apparatus, and all of which produce on the canvas that effect, which sometimes also a double cloth and surfacetess, which the machine does not offer, as such, sufficient space for larger embossing machines, for tandem, chain, and coarse embossing machines designed for the purpose have been provided with special arm-shafts, which carry the needle and the tambouring apparatus, and which can be freely turned. The motion of the needle is transferred from a vertical shaft to a needle by means of bevel gear, or by pulleys and cords, and the motion transmitted by the machine is passed to the needle through the arms of the patterns of the former is effectually by a movable parallelogram.

Machine of this kind is exhibited at Vienna by several manufacturers, amongst whom we have to mention Mr. Heinrich Schutz, of Weingarten, in Wurtemberg, whose machine, which is mounted in a frame, carrying at the bottom a rope drum, which is put in rotation by a foot-board. From this drum the shaft is passed by the machine to the jointed needle, and working the needle, is moved directly by a cord. An experienced worker can make with this machine from 500 to 1500 stitches per minute. The Sächsische Stickmaschinen-Fabrik, of Kappel, near Chemnitz, exhibits also such a machine, but with four arms fixed on the main shaft. The stuff to be embroidered is fixed uniformly in four departments of a frame, for each of which an embroidering arm is provided. All four arms can be moved simultaneously and uniformly by means of a guide and parallel motion. We should mention that this machine is also changed in a certain angle of a frame may be extended to the length required. Each of the arms can make about 600 stitches per minute. A fourth and last exhibited machine, made by Bonnay, exhibited by E. Comely, of Paris; we shall return to it when reporting on sewing machines.

Mr. Joseph Buda, of Vienna, exhibits a needle-embroidering machine, which is similarly arranged to the looms for figures in the weaving of ribbons, and which is more of a loom than an embroidery machine. Of greater interest, however, are embroidery machines on Heiland's system, of which three are to be found at the Exhibition, exhibited by the Maschinen Werkstatt of St. Georgen, St. Gallen, and by Meyers, Rieter and Co., of Switzerland. The three machines are in the same manner, carrying in a suitable wide frame the suspended embroidery frame, which is carried from oscillating by property fixed parallel. This frame is fastened to the so-called "Aufkram," which consists of levers with movable parallelogram, one side of which moves in a pentagot, the pointer of which is carried on a part of the frame, and the other fixed on a plane about ten times the size of the pattern to be stitched by the machine. It will be understood that the machine is worked in such a manner, that the position marks that position which moves in the pentagon, of the frame carrying the material, and that the tracing is done in any given direction, and to a point that position marks the place in the pattern on the fabric where the next stitch will be made. The directions are supported by a lever, which is provided with an eye in the centre, and are carried at the end by a pair of nippers. The carriage
advances close to the stuff stretched out, and its advance causes all the needles provided with threads to pierce through. At the other side of the stuff a second carriage has arrived, which takes off the needles after they have been set free by the opening of the nippers already mentioned. This second carriage is then drawn back again as the length of the thread will allow. The worker now marks the next point on the pattern where the frame, with the stuff stretched upon it, is brought into the corresponding position, and the second carriage is advanced close to the stuff, repeating thus the stitching manipulations. Apparatus for bordering, figuring, and circular stitching are connected with these machines. The number of needles varies, according to the machine being single or double acting, sometimes even three lines of embroidering needles are applied. The work done by these machines varies between 1500 and 3000 stitches per day. The machine exhibited by the Maschinen-Fabrik St. Gallen has two lines of needles, and the single needles are placed at distances of 1½ in.; the machine is provided with a so-called “boring” apparatus, that is to say, with a contrivance for the cutting out of circular holes, round which the stitching has been finished. The machine is exceedingly well built, and works well without interruption. The same can be said of the two other machines.

The Sächsische Stickmaschinen-Fabrik, of Kappel, exhibits further a machine for the “pricking” of patterns, so that the perforated drawing may be used as a sort of stencil plate for the first print of the pattern.