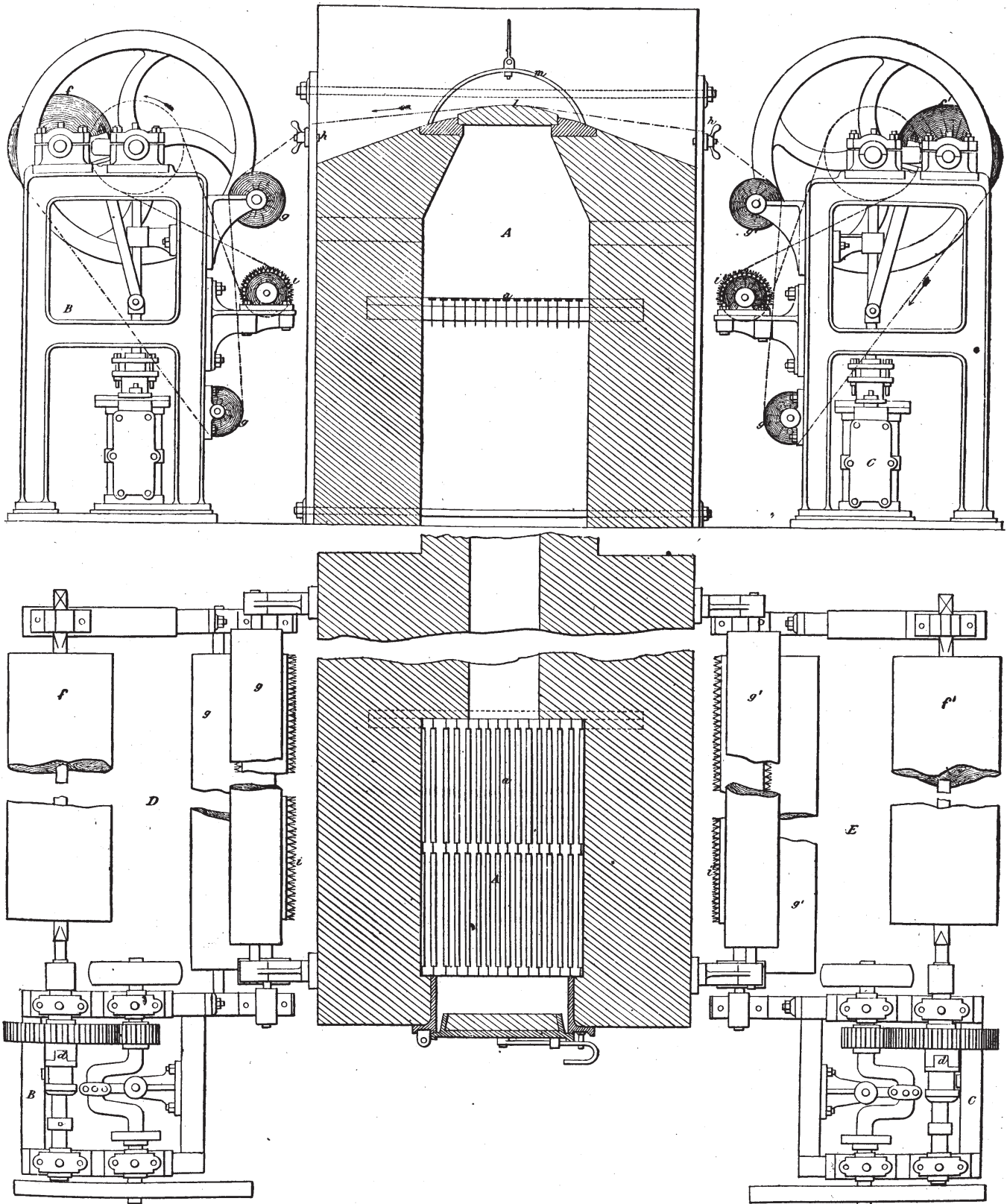


SINGEING MACHINE, AT THE VIENNA EXHIBITION.

CONSTRUCTED BY THE ZITTAUR MASCHINEN-FABRIK UND EISENGIesserei (FORMERLY ALBERT KIESLER AND CO.), ENGINEERS, ZITTAU.



TEXTILE INDUSTRY AT THE VIENNA EXHIBITION.—No. XIII.

By DR. H. GROTHE.

FINISHING MACHINES.

ABOUT half a century ago the term "finishing machine" could be applied to perhaps half a dozen

machines only, and but small accommodation was required for the trade of a finisher. With the exception of a fulling mill there was at that time no machine which was worked by other than hand power. To-day this state of affairs is entirely changed, and immense buildings are filled by "finishing" machines; while manual labour being

dispensed with, steam gives motion to thousands of machines of all kinds necessary for the finishing process. There is scarcely a branch of industry that has been so thoroughly created by mechanical engineering as that of finishing and stuff-printing, while at the same time there is probably no branch in which the inventive genius of

man has gained a greater success for an equal amount of originality is scarcely to be met with throughout the whole of the departments of textile industry. In proof of this we may instance the warping frame, the drying machine, the friezing machines (ratineuse), the magnificent printing machines and pentagraphs. The finishing and stuff-printing machines have to deal with the woven stuffs, and have to prepare them so as to deceive the eye of the buyer; for with the exception of the woollen stuffs and cloths, all other materials of less value are provided with a surface lustre which covers the inferior quality of the material, and considerably improves its appearance. What becomes, for instance, of the simple cotton stuffs under the action of Mulhouse's printing machine? The knowledge of the manufacturer that this branch of mechanical engineering offers means for increasing considerably the market value of his products, has caused a great number of interesting machines to be designed and constructed, and this was shown in a striking manner by the Exhibition at Vienna, which contained a good collection of finishing machines of various types. In giving a review of this collection, we shall follow, as much as possible, the course of the finishing processes.

Nearly all stuffs contain, when taken from the loom, certain impurities and dressings, such as glue, &c., which have been used to keep the warp together, and which are therefore of a sticky nature. To remove these matters, washing machines are used, but of these machines no example was exhibited at Vienna. Cloth-like stuffs, however, are placed in the fulling mill, in order to facilitate the closing or felting of the materials. The best fulling machine exhibited at Vienna was certainly that by Mr. Leopold Ph. Hammer, of Aix-la-Chapelle, complete illustrations of which we shall publish shortly. This machine is a "universal" fulling machine, so called, because by the arrangement of the various parts it may be used for the fulling of stuffs of various qualities. An ingenious improvement of the feeding apparatus causes the fulling to take place simultaneously at several places in the machine, whilst the stuff is not pulled out by the cylinder, as in the ordinary construction, but by the feeders. The feeding apparatus is also provided with a cloth measurer, which saves the inconvenient and time-requiring measuring of the stuff by hand. A further improvement is the lining of the sliding surfaces with glass. The fulling is assisted by beaters and by a movable flattening apparatus, with adjustable glass admission rollers. Such a perfect arrangement must necessarily work well.

Messrs. Gottlieb Schramm and Dill, of Hersfeld, exhibited an ordinary fulling machine, with two fixed rollers and a large fulling disc; the machine is well built, but does not offer anything new in its construction. We may further mention the fulling machine with hammers, exhibited by Mr. Gessner, of Aue, and several drawings and models of fulling machines; none of which, however, show any particular improvement in their construction.

The fulling machine is then dealt with on the gig mill; a double-acting machine of this kind, but of the ordinary well-known construction, although of good workmanship, is exhibited by Mr. Gessner, of Aue; whilst the Belgian gig mills, belonging to Messrs. Bede and Co. (Houget and Teston), and Messrs. Neubarth and Longtain, both of Verviers, contain some new and interesting details. Messrs. Bede and Co.'s gig mill contains two teasing cylinders, and works with four so-called "touchements." The one of the teasing cylinders moves always in one direction, whilst the other cylinder may rotate in the one or the other direction, thus giving the power of teasing with or without counter-touch. A suitable contrivance effects a perpetual flattening of the stuff passing through the mill, whilst an auxiliary cloth prevents the extreme stretching of the stuff in the direction of its length. We shall be able to publish a special description and illustration of this machine in an early number. The gig mill of Messrs. Neubarth and Longtain contains also two cylinders and four "touchements." (This machine had already been exhibited in 1867 at Paris.) The arrangement of this mill is very simple, but the contrivance for stretching, and the apparatus for lifting the stuff at any time from the cards are worth mentioning. During the teasing with this machine the stretching remains constant, and a roller passing up and down produces the desired approach of the stuff towards the cards. A disperser removes uniformly all folds that may be

produced. Two rollers, which draw the stuff from the box, compensate the whole weight of the former, whence this weight cannot exercise an influence on the action of the machine. The width of the machine is 9 ft. 10 in., the depth 13 ft., and the weight 2500 kilogrammes; the machine makes from 100 to 110 revolutions, and requires about two horse power.

In the French department we find one gig mill only, exhibited by Messrs. Bergeron Brothers, of Nîmes. We should mention also an Italian gig mill, by M. Giacomini, of Treviso; this machine is provided with what the exhibitor calls "quarnitura metallico vegetale," and which consists of alternately arranged series of wire cards and of breaking-straw, cleaned continuously by a roller. We feel inclined to count this machine in the category of brushing machines, because, if covered entirely with breaking-straw, it should do good service.

We may here mention especially the metal cards of Mr. W. Fürth, of Strakowitz, which are proposed as a substitution for the natural cards of the teasel (*dipsacus fullonum*); such experiments have often been made, but always with little success. In the Austrian Agricultural department we find the plant of the teasel, and next to it, in a prepared state, that part of it which is used for the teasing process; we are told that four farmers began in Styria, in 1826, to cultivate the teasel, when they obtained a first harvest of 8000 pieces, but in 1872 not less than four hundred farmers and peasants cultivated the plant and harvested between 40 and 50 millions of heads. The chief merchant of these teasels is Mr. Franz Rotsch, of Graz.

We must pass next to the shearing or cropping machines, of which ten were exhibited at Vienna; and amongst which the first place belongs to Mr. H. Thomas, of Berlin, whose works have existed since 1845, and whose finishing machines are known all over the world, on account of their good design and excellent workmanship. Mr. Thomas exhibited at Vienna a shearing machine, with one cutting blade, another with two cutting blades, and a third one for the cutting out of the back of figured shawls. We shall be able to lay before our readers illustrations showing the general arrangement of these machines. Mr. Hoffmann, of Fürstenwalde, exhibited a longitudinal shearing machine, and Mr. Tillmann Esser, of Birtscheid, a double longitudinal machine. The Austrian manufacturers of shearing machines are well represented by Messrs. Fr. Scheffel and Co., of Reichenberg—who exhibited a transverse and a longitudinal shearing machine, and a brushing machine, all of good workmanship and design—and by the shearing machine of Messrs. G. Josephy's Erben, of Bielitz, which is on the longitudinal system, with a cutting cylinder having 20 blades. In the Belgian department we found shearing machines exhibited by Messrs. Bede and Co., and Messrs. Neubarth and Longtain, both of Verviers. Messrs. Bede and Co. call their shearing machine at the Exhibition "Tondeuse longitudinale finisseuse," and they state that it is designed for woollen stuffs and shawls of light material. With a width of 1.60 met. (5 ft. 3 in.), the cutting cylinder makes 130 revolutions per minute; the machine is extensively used on the Continent, especially for barge, cotton, and figured stuffs. Messrs. Neubarth and Longtain, of Verviers, exhibited a longitudinal shearing machine, in which the lower knife has a peculiar position, by means of which the stuff is sharply flattened, and, we may say, finished. Besides those named above, Messrs. Tulpin frères, of Rouen, exhibited a double-acting shearing machine, with a movable table and a coupling of the two cylinders.

We must not omit to mention here the cutters or shears exhibited at Vienna. Messrs. F. Schlenker and Co., of Aix-la-Chapelle, exhibited a large collection of such cutters, of excellent quality. M. F. Ph. Troupin, of Verviers, exhibited a collection of details of shearing machines, such as right and left-handed cutters, elastic tables, &c. The cutters exhibited by Messrs. Xhonneux and Derrez-Debial, of Verviers, are of considerable importance and value; we find amongst these cutters some with double edges—a new system, which has to be tested by practical use before an opinion can be expressed. Mr. C. J. Klaebe, of Dresden, exhibits brushes and brushing rollers for shearing cloth. We may speak at this place of the friezing machine of Mr. Max Strakosch, of Brünne, which is arranged for twelve of the best-liked ratteens, and which can be easily altered for small and large ratteens, and for cross and diagonal "boys." The motion of the

friezing plate is effected by means of eccentrics in such a manner that the forward and backward motion takes place steadily and without oscillation. The friezing shaft surrounds, with a hoop open at the bottom, the eccentric on the main shaft in the lower part of the frame, and passes at the top through a horizontal eccentric, which, carried by the friezing plate, produces the motion in the direction of the length of the table. By means of suitable arrangements, the distance of the table from the friezing plate may be altered.

The removal of the flocky and fibrous projections from the surface of cotton stuffs by means of the shearing machine, would be inconvenient, and would require too much time, whence a more simple mode of performing this has been adopted, namely, by singeing the surfaces. Machines for this purpose, called singeing machines, were exhibited at Vienna by three manufacturers. As many of our readers will remember, M. Tulpin, aîné, of Rouen, exhibited at Paris, in 1867, the best gas singeing machine that had been constructed up to that time, and since then this machine has often been built in Germany in an excellent manner, for instance, by Mr. F. Gebauer, of Charlottenburg, near Berlin. Messrs. Tulpin frères, of Rouen, the successors of the firm named above, exhibited at Vienna a machine of the same class, but with eight singeing rollers, and an additional arrangement for stuffs requiring a small amount of singeing only. The machine is provided with friction gear for a fan, and with feeding rollers.

The other singeing machines which are exhibited by C. G. Tietzen's Eidam, of Bautzen, and by the Zittauer Maschinenfabrik und Eisengiesserei (formerly Albert Kiesler and Co.), of Zittau, are built on the cylinder system. The machine of the last-named works is exceedingly well arranged for continued working with two separate steam engines; this machine is represented by our engravings on page 373.

This machine consists, as will be seen from the engravings, of the hearth A (above which the singeing plate *l* is placed in a cast-iron frame), and of the brushing and winding apparatus D and E, driven by the two small steam engines B and C. This arrangement, which is new and very convenient, follows the general principle now adopted in the construction of finishing and printing machines, according to which each machine is provided with a separate motor. The perfection of the products and of the fabrics of the present time could not be obtained with the former system, in which all machines were driven by means of shafting from one common motor; the influence on the motor and the speed of the shafting effected by the putting out of gear of one or the other of the machines, was transferred at once to the fabric. With the system now adopted, all these inconveniences are avoided, as each machine is independent of the other, whence it is evident that power and time are saved, and more uniform products are obtained, and in larger quantities. By means of the clutches *z*, the singeing apparatus may be put out of work without stopping the engine. The stuff passes from the cloth beam *t* over the rollers *g*, against the brush *i*, and going over the adjustable knife *h*, passes over the heated plate *l*, from whence it finds its way over the corresponding parts of the other machine. If a further singeing is required, the machines are reversed, and the manipulations are repeated, but in the opposite direction. The brush *i* serves to raise the fibres of the stuff before arriving at the singeing plate, so that they may be more quickly caught by the heated surface. The cover *m* is placed over the plate *l*, as soon as the machine is stopped; this is done in order to prevent the air from coming into contact with the heated plate *l*. The speed with which the stuff passes over the plate varies according to the thickness and condition of the stuff and the temperature in the room.