IMPROVED FINISHING PRESS.

The engraving represents an improved machine for finishing textile fabrics, invented by Mr. Houston. In machines of this kind the goods are generally passed between drums heated by steam, and are, besides being exposed to pressure and heat, subjected to a longitudinal strain in passing from one set of drums to the other. Besides that the heat to which the different portions are exposed is not equally divided, some parts being overheated and sometimes burnt, while others are not even completely dried. These disadvantages Mr. Houston claims to have overcome in his machine.

There are two large drums, A and B, through which steam circulates. P and R are toothed wheels firmly connected with the drums. They are acted upon by cam wheels, *o* and *p*, respectively, on the shaft, *n*. Both cam wheels may be withdrawn and replaced again in position by means of the sliding collars, M and N. H and I are friction pulleys. The shaft, *n*, is turned by an endless screw and toothed wheel, receiving their motion from a belt and pulley. The collars, M and N, and the cam wheels, *o* and *p*, turn the drums in opposite directions; one cam wheel only works at a time, the drum not acted upon by the cam wheel being carried along by the friction pulley. Thus the operator is enabled to change the motion of the drum as often as necessary. From the drum, A, to the drum, B, a long sheet or band of copper or steel extends, and alternately winds and unwinds round both drums, carrying the goods along. The fabric is unrolled from a cylinder, T, moved solely by the tension of the goods as they are rolled on the cylinder, B. The copper band is heated on the cylinder, A, and catches in descending the sheet of cotton, linen, etc., and rolls up along with the same on the cylinder, B. Thus the entire surface of the goods comes in contact with the heated metal, and is equally exposed to the pressure exerted by the concentric sheets of copper. The goods are in no way strained, but subjected to heat and pressure only, and all folds are effectually removed.

Very little attendance is necessary; one man can attend to several machines.—*Musée de l'Industrie.*

MILLING MACHINE.

We give a perspective view of a handy type of self-acting universal milling machine constructed by Messrs. Greenwood and Batley, of Leeds. As will be seen from our engraving, which we take from *Engineering*, the machine has a deep bed supported on two short standards, and having cast in one piece with it the upright which carries the milling headstock. This headstock has a vertical traverse of about 10 inches, and it is provided with a self-acting downward feed. On the milling spindle is a gun metal spur wheel, into which a wrought iron pinion gears, this pinion being on the same shaft as a belt pulley. The milling saddle also carries a pair of idle pulleys, and the driving belt passes round these and the pulley on the pinion shaft, in the manner shown by our illustration, the milling headstock being thus free to be moved up or down without interfering with the driving gear.

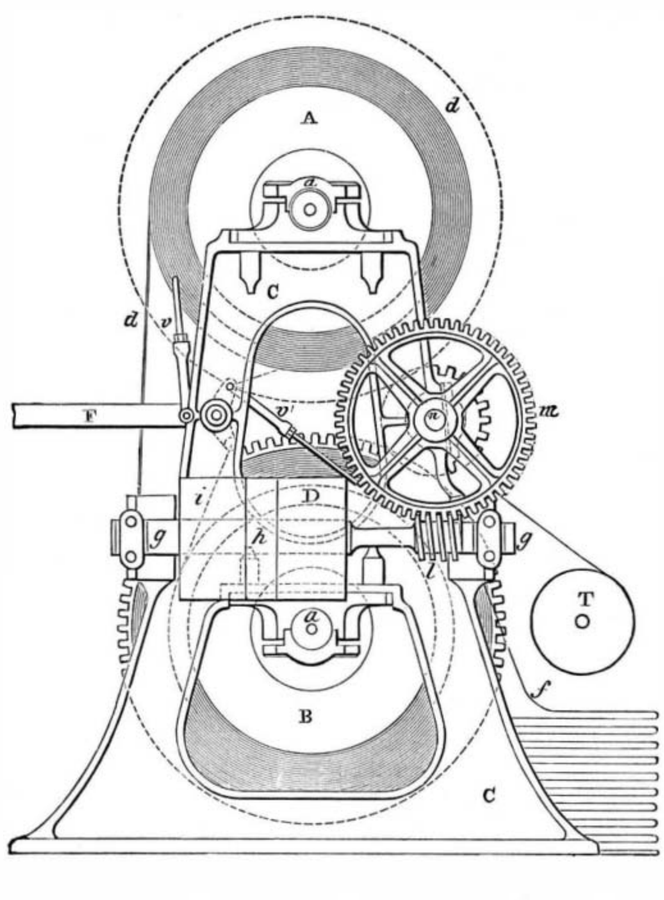
The milling saddle, which has a self-acting feed and stop motion, and the horizontal traverse of which is about two feet, moves on a slide formed on the side of the deep bed of the machine. On the saddle is mounted an accurate dividing motion, with thirteen rows of holes gearing up to 144 divisions. The dividing motion carries on its top a four jawed chuck taking in articles up to three inches in diameter, and also sufficing to hold a vise or other mountings. The machine is altogether a very handy one, suitable for a variety of work. We may add that one of these machines was exhibited by the makers at the Paris Exhibition last year.

Morocco.

Philadelphia stands at the head of the morocco trade of the United States. The amount of this kind of leather made by the thirty-two firms engaged in the business is placed at $4,000,000 annually. During the busy season 1,080 dozen goat skins are daily turned into morocco; this would require at the rate of 4,000,000 skins a year.

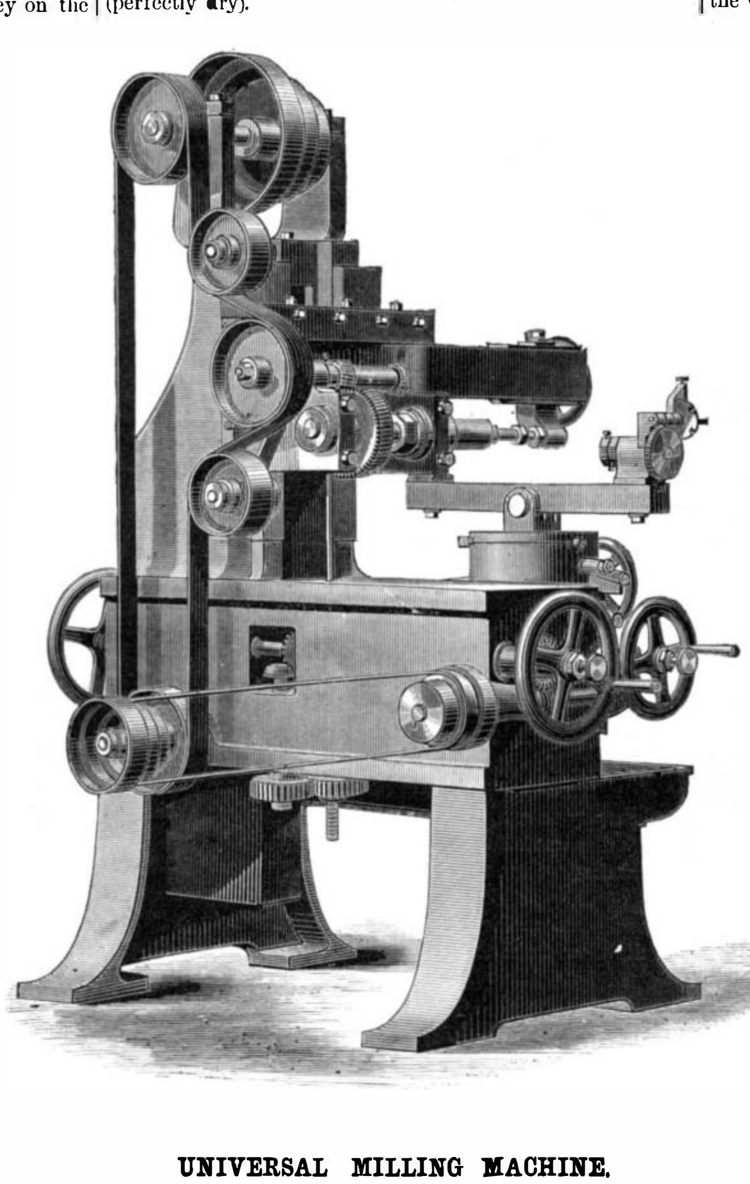
The trade has gone through the financial crisis and recovered therefrom, notwithstanding the heavy losses. The sales for the season now over are ahead of those for the same period last year, and have been fairly satisfactory. The demand for brush kid has been heavier during the past season than was ever before known in the history of the morocco trade. The skins used are Tampico, Cape, Curaçao, and South American, known as soft stock, and Patnas, Madras, and Cawnpore Madras, classed as hard stock. These terms are applied to the condition of the skin in the hair and before tanned. Of late years the European skins have been largely worked into cheaper moroccos. Brush and glazed kids, bright and dull pebbles, maroons, and straight grains, both black and in fancy colors, are the designations by which most of the moroccos made are known.

The tanning is done in the old way, and by what is known as the "bag" process, in which the skins are first sewed by hand or machine and the sumac and sumac liquor forced inside. The open tan process, by which system the skins are hung in the liquor, is being gradually adopted. Machinery is largely employed in the tanning and finishing of moroccos, excepting on the finer grades, in which the work is still largely done by hand. With the general introduction of steam the drying of skins is greatly facilitated, and there is no such enforced dependence upon the eccentricities of the weather as was the case years ago.—*Shoe and Leather Reporter.*



THE HOUSTON ROTARY FINISHING PRESS.

CEMENT FOR COATING ACID TROUGHS.—Melt together 1 part pitch, 1 part resin, and 1 part plaster of Paris (perfectly dry).


UNIVERSAL MILLING MACHINE.

A New Wind Engine.

Mr. W. Thomson, Professor of Mechanical Engineering in the Iowa College of Agriculture, describes, in the *College Quarterly*, a new windmill, which has been recently constructed and put in use at the above institution.

From the following description any mechanic can construct a windmill on the Professor's plan, and according to his testimony it is an entire success.

Previous to the fall of 1878, the water was forced to the several departments of the college by a No. 7 Knowles pump, running on an average of four and one half hours each day. The height to which the water has to be raised in the main building is 106 feet 7 inches —the amount required here being about 6,000 gallons in twenty-four hours; the other departments require about 2,000 gallons in the same time, which has to be raised to an average height of about fifty feet. The cost by this system (coal delivered at the well for $3.20 per ton, and firemen's wages being 61 cents per day), averaged about $45 per month.

It is evident that a wind engine would do this work cheaper than steam, since, in raising water, there is no objection to a variable motion. From a study of the various kinds, and their construction as to efficiency and durability, says Professor Thomson, it was evident that the greatest efficiency of the acting cylinder of wind was not reached by the mills in use at the present time. We therefore concluded to construct one that would fulfill this condition as nearly as possible. Knowing the amount of work to be done, and allowing for friction in the pipe, and for waste and leakage at the different points along the line from which water is drawn, and assuming the velocity of the wind to be fourteen feet per second, and that the efficiency would not be less than thirty-three per cent of the acting cylinder of wind, it was shown by calculation that a wheel eighteen feet in diameter would do the work and furnish an ample supply as long as the above velocity was maintained. During the fall and winter this wheel was made and set in position ready for the work in the spring. The construction is as follows: The arms are eight in number, made of wood and bolted to a spider which is keyed to the crank shaft. The pieces to which the vanes are fastened are circular arcs of iron, and are fastened to the arms by being bent at the ends radially and toward the center; bolts passing through these ends and the arms, thus fastening them securely together. There are sixty-four vanes, seven feet long, four and one half inches wide at the center end, eleven inches at the tips, and are fastened to the circular arcs by clips which are riveted to the vanes and bolted to the circular arcs. The vanes are made of iron for the following reason: In order to get from the wind the greatest amount of work, they should be curved or twisted from the center to the tips, the amount of twist depending upon the length. They are also made slightly concave on the face, in order to cause the stream of air to leave the vane at as near a right angle as possible to the direction that it has when it first strikes it, and this curvature can be more readily given to iron than to wooden vanes. By making the clips of the proper length the desired amount of twist was given to them, the angle at the center being about 45° and at the tips 25° to the plane of rotation. That this form of vane is instrumental in taking from the wind the greater part of its living force, is evident from the fact that back of the wheel, even when a high wind prevails, there is but little motion in the air discernible. In order to make the wheel strong and rigid, it is trussed by half inch rods in front and back of the arms. The shaft is two and one-eighth inches in diameter, and has a crank forged on it with bearings on both sides of the crank. These bearings are on a large hollow cylinder, through which the connecting rod passes to the pump rod, which is made of one inch iron pipe and answers well, as it can be readily connected and disconnected when desired.

The pressure on the pump due to the height is 48 lb. per square inch; this is shown by calculation and also by a pressure gauge at the surface of the water in the spring. This gives a pressure on the crank of 336 lb., the diameter of the pump barrel being 3 inches and stroke 6 inches; the force of the wind at the assumed velocity and efficiency would be 560 lb., and the corresponding velocity of rotation is about twenty revolutions per minute; amount of water raised, twenty barrels per hour. The amount of water raised is much more than these figures would indicate. It is also evident from the performance of the wheel that a less velocity than that assumed will run it, and it is often remarked that that mill will run without wind.

If only one half of the above result was obtained, it would still pay to run the mill in connection with the steam pump; but since the first of March, the amount required has been furnished by the mill with the exception

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