

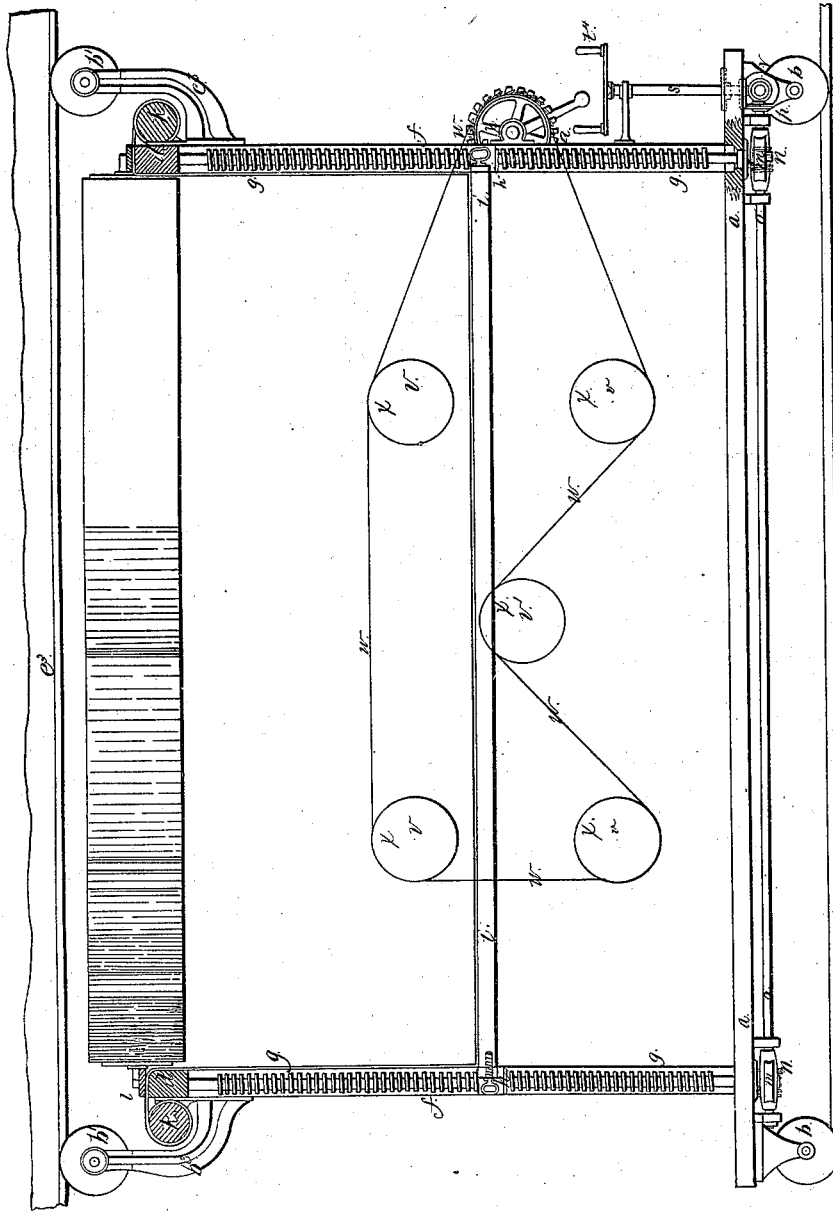
J. Taylor.
Woven Fabric.

Sheet 1-4 Sheets.

N^o 7,403.

Patented May 28, 1850.

Fig: 1.

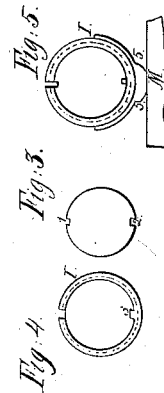
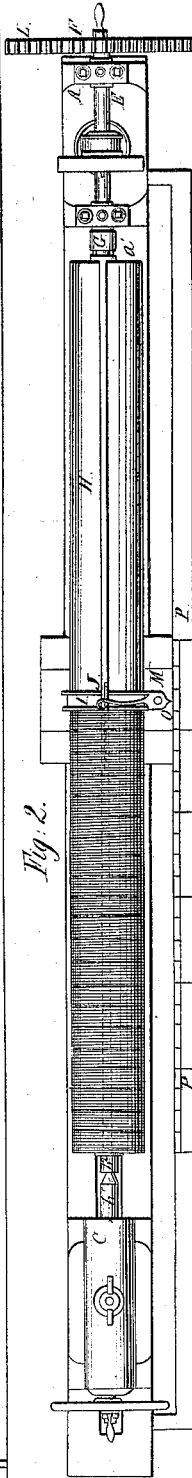
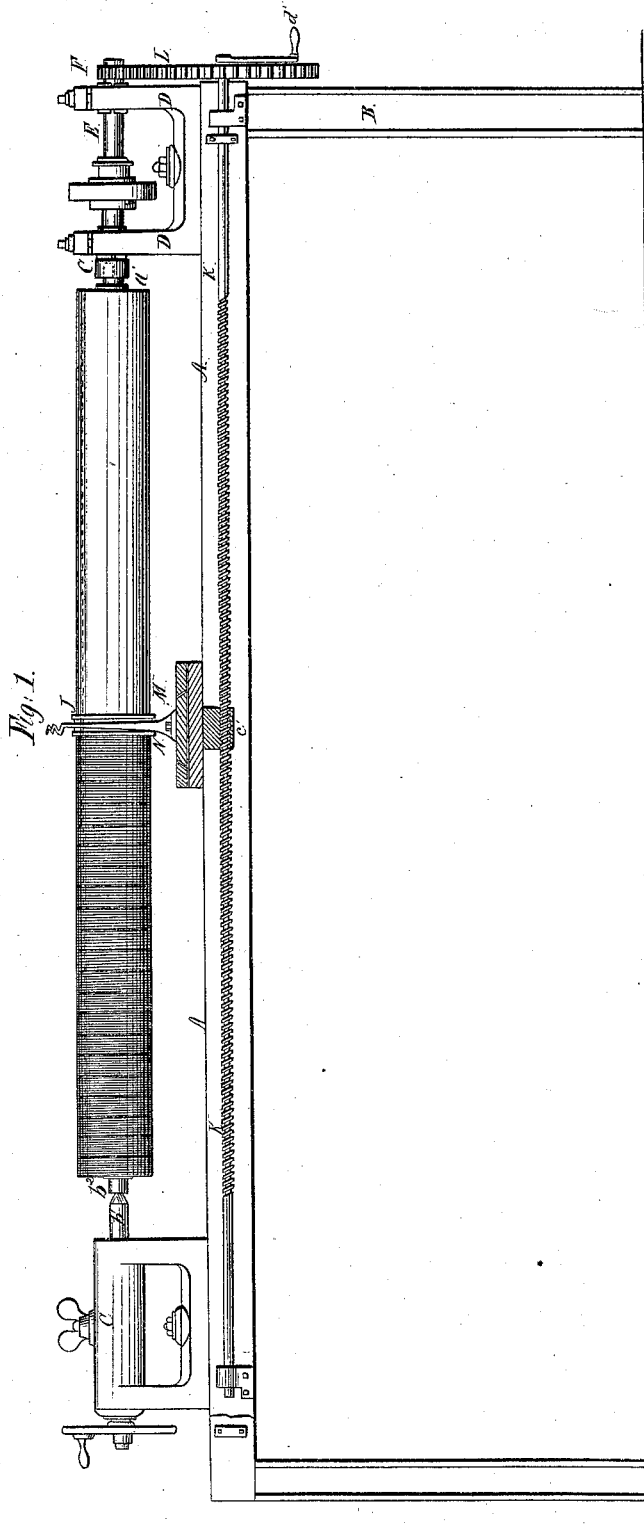


J. Taylor.
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Sheet 2-4 Sheets.

N^o 7,403.

Patented May 28, 1850.



J. Taylor
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Sheet 3-4 Sheets.

N^o 7,403.

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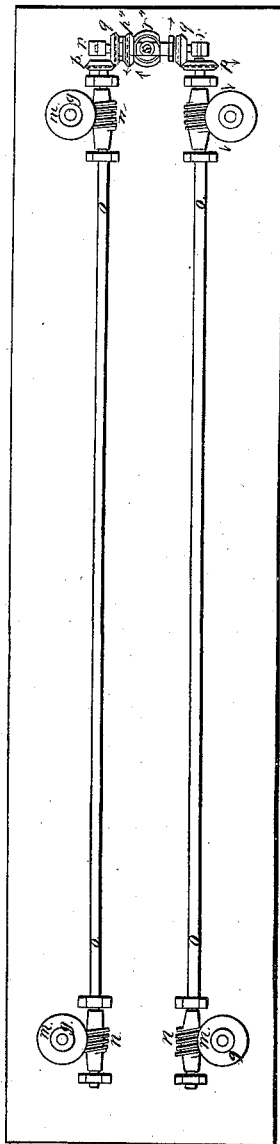


Fig. 4.

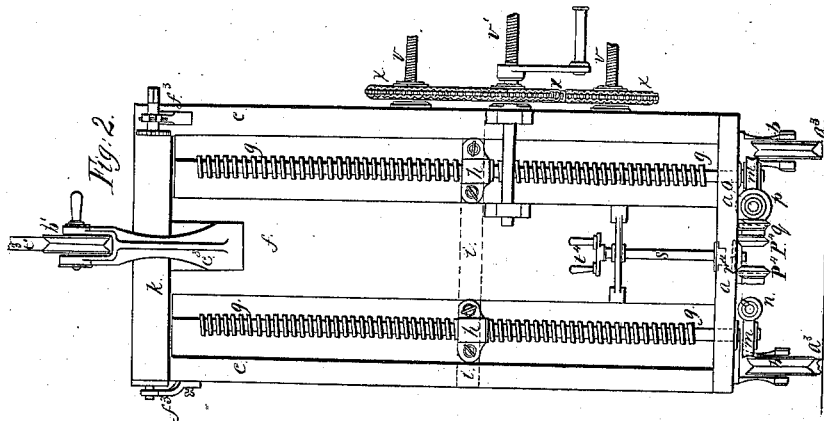


Fig. 2.

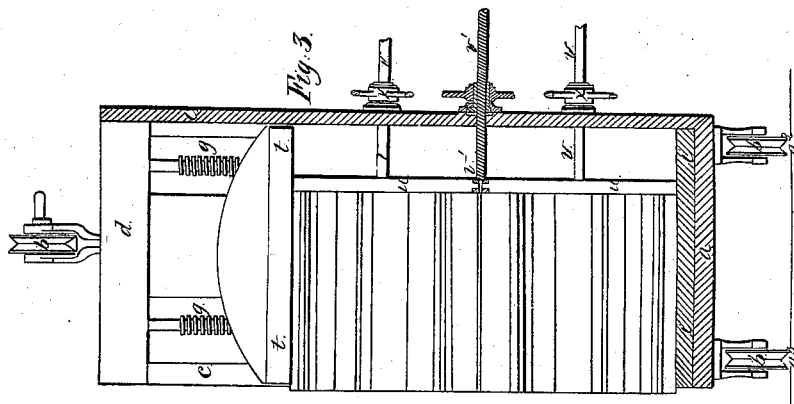


Fig. 3.

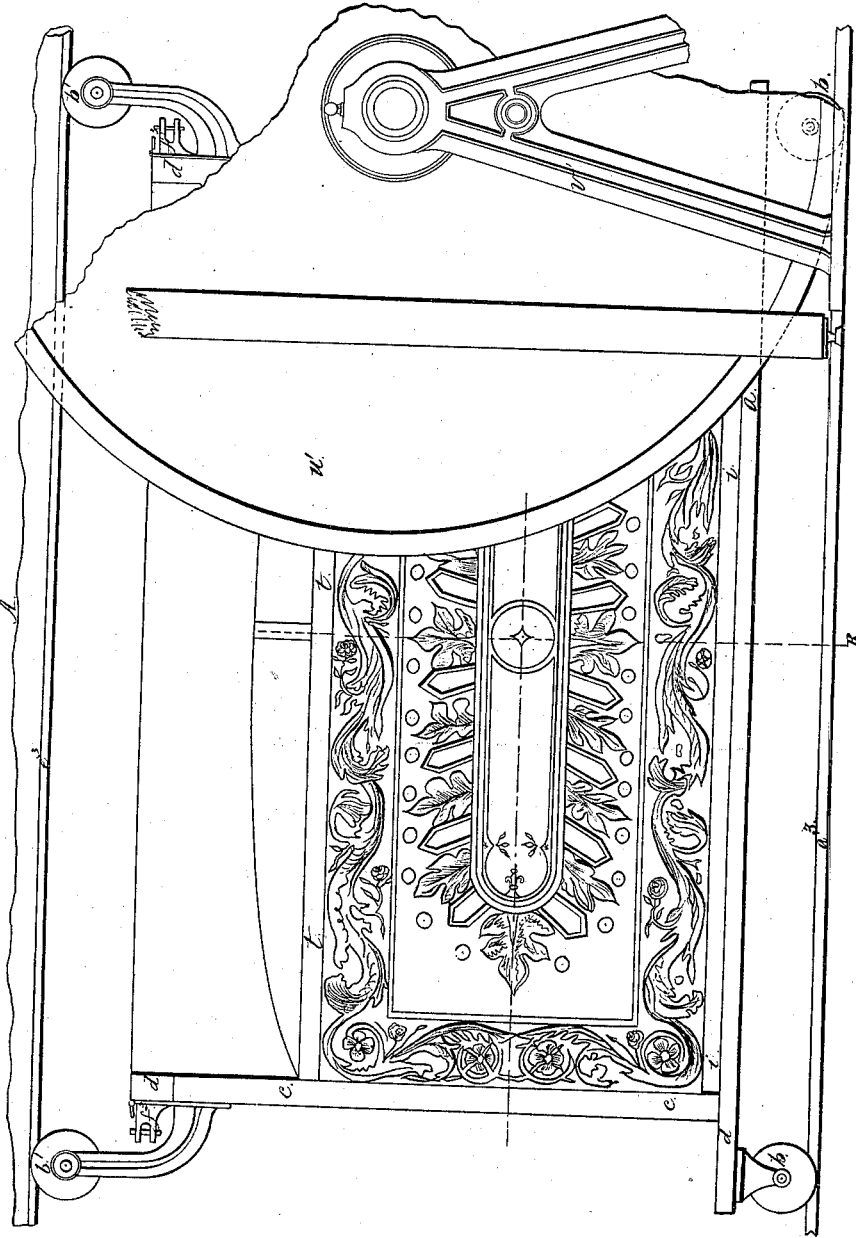
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Patented May 28, 1850.

Fig. 5.



UNITED STATES PATENT OFFICE.

JAMES TAYLOR, OF LOCHWINNOCH, SCOTLAND, ASSIGNOR TO JOHN JOSEPH AND FRANCIS CROSSLEY.

PREPARATION OF PILE FOR RUGS, &c.

Specification of Letters Patent No. 7,403, dated May 28, 1850.

To all whom it may concern:

Be it known that I, JAMES TAYLOR, of Lochwinnoch, in the county of Renfrew, Scotland, carpet and rug manufacturer, a
5 subject of the Queen of Great Britain, have invented or discovered certain new and useful Improvements in the Manufacture of Carpets, Rugs, and Piled Fabrics; and I, the said JAMES TAYLOR, do hereby declare
10 that the nature of my said invention and the manner in which the same is to be performed is to be particularly described and ascertained in and by the following description thereof, reference being had to the
15 drawings hereunto annexed and to the figures and letters marked thereon—that is to say—

My improvements in the manufacture of carpets, rugs, and other piled fabrics refer
20 to that class of fabric which is produced by cementing the pile to strong cloth (which forms the back of such fabric) by means of India rubber or other suitable adhesive substance the difficulty experienced in arranging the lengths of wool or worsted yarn used
25 in this manufacture to form the pile so that their ends shall form any desired pattern has long prevented the successful working of this method of producing piled fabrics
30 but by my improvement I am enabled to lay down given lengths of differently colored yarn in such quantities as will admit of any required pattern being copied with precision and rapidity.

35 In Sheet I of the accompanying drawings are several views of the apparatus which I employ for the above mentioned purpose. Figure 1 represents in elevation and Fig. 2
40 in plan view, an arrangement of machinery somewhat similar in construction to the bed and slide rest of a lathe for winding up the variously colored threads which are to form the pile of the fabric to be manufactured.

45 A, A is a cast iron bed the edges of which are planed true.

B, B are standards for supporting the bed A which is provided at one end with an adjustable head stock C similar to that of a common turning lathe and at the other end
50 with a fast head stock D.

E is a spindle having its bearings in the head stock D and carrying on its outer end a wheel or pinion F its inner end is provided with a square socket G.

55 H is a beam or roller which may be made

either of metal or wood but if of wood I prefer to construct it of strips or pieces of wood joined together in order to prevent the beam from warping. This beam is intended to receive upon its surface a coating of
60 worsted thread or yarn which is to form a portion of the piled face of the fabrics to be produced. It is furnished at each end with a center pin a' , or b^2 , one of which is made square to fit into the socket G and the other
65 is hollowed to receive the center pin b' , of the adjustable head stock C. In the face of the roller H and at opposite sides to each other two longitudinal grooves 1 and 2 are cut (see Fig. 3 which denotes a transverse
70 section of the roller which reaches from end to end of the roller) one of these grooves is intended to receive a stud 3 projecting from the inner face of a flanged collar I as seen
75 in Fig. 4 which is a section of the said collar which fits into the roller for the purpose to be hereafter explained. The other groove is for receiving a hooked wire J the object
80 of which is to hold successively the ends of the several worsted threads while the same are being wound upon the roller in the following manner. Having wound on one
85 color of wool and it being desired to wind on a fresh color the end of the fresh yarn is twisted around the wire J so as to be held thereby the wire is then passed into the
85 groove in the roller with the stem of the wire under the yarn already wound thereon by which it is held from falling out. In
90 winding on, the collar and wire are moved along leaving the thread which has been held, and the wire is ready to have another thread of yarn fastened thereto. This collar I has an opening 4 in its circumference
95 on the opposite side to that of the stud and when placed upon the beam comes in a line with that groove which receives the wire J before mentioned.

K is a screw mounted in bearings (attached to the bed A of the apparatus) and
100 having a cog wheel L keyed on its outer end and made to engage with the pinion F. This screw K passes through a female screw c' , which is bolted to the underside of a saddle M and when made to rotate by
105 manual or other power causes the said saddle to traverse the bed plate in a manner similar to that of a slide rest of a lathe when moved in its supporting rails. From the upper face of the saddle two studs 5, 5 pro- 110

ject and extend and fit into the groove of the collar I (see Fig. 5) formed by the flanges before mentioned. By this means the saddle M when it traverses the bed A will draw the collar I over the roller or beam H.

N is a bent arm attached to the saddle M and carrying on its upper end a hook similar to the end of a flyer the said hook being for the purpose of guiding the yarn whilst being wound upon the roller.

O is an index hand which points to the graduations on the table P in order to show the workman the progress of the winding on operation.

Having described the various parts of the machine I will now proceed to show the manner of working the same. Suppose a number of bobbins containing woolen yarn of different colors to be suspended above the machines and a slip of paper containing one row of a pattern of a carpet squared and colored similar to a pattern for Berlin wool work to be laid on the table P, the workman turns the screw K in order to bring the saddle M to the left hand end of the roller H. A thread is next drawn from a bobbin containing (say,) red worsted, passed through the hook or guide on the end of the arm N and tied around the roller H. Rotary motion is next given to the screw K by means of a handle *d'*, on its end, and by means of the cog wheel L and pinion F, on the spindle E, the roller H is caused to revolve and take up the thread on to its surface. When two or three coils are wound on the roller H the wire J is slid into the groove 1 of that roller just below the cut 4 in the collar I and it is held in its place by the thread which has just been wound on the roller and covers part of the groove, it will now be understood as long as the screw revolves the movements of the saddle M and the roller H will be continuous and that their respective speeds may readily be adjusted by changing the gearing L and F as required. From the foregoing description it will likewise be seen that as the saddle M traverses the bed A the index hand will be carried forward over the colored pattern P, P Fig. 2 and show the workmen when to cut off the red thread and commence winding on the next color, say blue. The arm N and the collar I will be also carried forward and at the same time the collar I will rotate with the roller by reason of the pin 3 on its inner surface which projects into the groove 2 and guides the collar as it slides along that roller. Let it now be supposed that the index hand O has passed over the first red portion of the pattern and indicates blue as the next color, the motions of the machine are suspended until a blue thread is brought into the machine. To effect this the workman cuts off the red thread

pulls down from a bobbin above, one of blue, ties a knot in the thread and passes it under the wire J and into the guide of the arm N. Rotary motion is again communicated to the machine and continued until the index hand points to another color when a similar change of thread is effected according to the pattern on the table P. The changing of the threads is thus continued until the roller is filled with colored threads or yarn forming a counterpart to the pattern on the table. By the time the surface of the roller is covered the collar I will have traversed the whole length of the roller and slidden off at the end. The center pin of the stock head C must next be drawn back in order to allow of the roller being taken out of the machine. Another roller is next mounted in its place and the next succeeding strip of pattern being exchanged for that which was previously on the table the workman can proceed as before. The use of the collar I is to compress the threads laterally as they are wound upon the roller for if the pattern or design be eight lines or a greater or less number of lines to the inch the collar by resisting the lateral spreading of the worsted or woolen threads will cause the thread to rise on the surface of the roller to the extent of an eighth of an inch or in the same ratio more or less according to the size of the pattern or the number of lines it may have to the inch the necessary pressure on the yarn being given by a relation subsisting between the wheels connected with the main screws and beam or roll as well also as by regulating the thickness of the line of wool and the speed of the main screw. As the collar I traverses the roller the hooked wire J must be drawn forward by the operator to prevent its being buried in the thread.

The beam or roller H having received a coating of wool as above explained two narrow strips of wood or metal of the length of the roller are affixed thereto one on each side of either of the grooves by pins or otherwise. A knife is next passed up the groove thus inclosed or between the strips so as to cut the coil of wool into lengths. The roller is then to be stripped of the wool and for that purpose it is taken to the machine represented in Sheet II which I will now explain. Fig. 1 of Sheet II represents a front view (partly in section) of such machine, in which the wool as it is taken off from the roller is laid out flat in layers to form any desired pattern. By this machine also the wool when "built up," or formed into a compact body may be forced forward and brought into contact with the edge of a sharp rotary knife which will slice it into sheets after the ends of the threads of wool have been cemented to a strong cloth or other suitable fabric. Fig. 2 represents the

machine in end elevation and Fig. 3 is a section taken in the line A, B of Fig. 5. The machine consists of a platform or flooring *a*, mounted on four grooved wheels *b*, *b* which are intended to traverse a railway *a*³, *a*³. On each side of the flooring are two standards *c*, *c* attached together by the cross pieces *d*, *d* and the back *e* which is closed the front of the machine being open as shown in the drawing. *f*, *f* are side pieces firmly bracketed to the platform or flooring *a* and carrying each a bracket *b*³, *c*³ on its upper end. In these brackets grooved wheels *b*¹, *b*¹ are mounted. These wheels have a bar or inverted rail *e*³ against the lower edge of which they run and they are intended together with the wheels *b* to guide the machine forward and backward as will be hereafter described.

g, *g*, *g*, *g* are four vertical screws having their bearings in the flooring *a* and the cross pieces *d*, *d*. These screws pass through the sockets *h*, *h* which are temporarily fastened to the ends of a table *i*, *i* and the said screws being made to rotate simultaneously will by taking into a worm made on the inner face of the sockets *h* for that purpose cause the table to ascend or descend as may be required. By referring to the drawings it will be seen that at the upper ends of the standards *c*, *c* are brackets *f*³, *f*³ which carry the rollers *k*, *k* one on each side of the machine. Upon each of these rollers, a thin sheet of copper and also a sheet of cloth both of a suitable length is wound (the same being denoted in Fig. 1, by red and blue lines proceeding from the rollers *k*, *k*) and so attached thereto that when unwound the sheets may be readily unfastened to allow of the rollers and their brackets on the front of the machine being removed. The sheet of cloth is wound on with the copper in such a manner that when drawn into the machine, it is against the side of the worsted.

One end of these sheets is attached to the table *i*, *i* the descent of which causes the sheets to unwind from the rollers. Above and parallel to each of the cross pieces *d*, *d* on each side of the machine is a metal bar *c*. These bars serve as guides as will be presently explained and are so placed that the sheets of copper may pass beneath them when unwinding. When a beam or roller covered with the wool or worsted yarn coiled around its surface is brought to this machine to have the wool taken off and laid down flat, the table *i*, *i* is brought up to the top of the machine, and one of the strips of wood or metal fixed on the beam, or roller, to keep the threads even while being cut is taken off. The beam is next rolled along on the guides or bars *l*, *l* which steady it, and keep it even in its progress, to the back of the machine. In this manner the wool is unlapped from the beam and the second

strip of wood or metal being taken therefrom the threads are altogether detached from the roller, and laid flat, and even, on the table *i*. Every succeeding beam is in like manner stripped of its wool until a sufficient number of layers are placed in the machine to make up the pattern required. As the layers of wool are placed above each other the table *i* is proportionately depressed, by means of the screws so that the surface of the uppermost layer of wool, shall be at the height the table was at the commencement of "building up" or forming the body of woollen threads. The mode of actuating the four vertical screws will be best seen at Fig. 4, which represents the gearing employed for that purpose, as if seen from below. Upon the lower end of each of the shafts of the screws *g*, *g*, *g*, *g* a concave toothed worm wheel *m* is keyed. These wheels are actuated by the endless worms *n*, upon the horizontal shafts *o*, *o*, and on one end of each of these shafts *o*, *o* the bevel wheels *p*, are keyed which take into bevel wheels *q* mounted on the shaft *r* suspended by brackets from the platform *a*, as shown in the drawing. On this shaft is also affixed the bevel wheel *p*⁴, which is actuated by a bevel wheel *r*⁴, mounted on the upright shaft *s* at the upper end of which a handle *t*⁴, for working the gearing is provided. It will now be evident that on turning the handle of the shaft *s* the vertical screws *g*, *g* will revolve simultaneously and cause the table *i* to rise or fall to any required distance.

When a sufficient number of layers of worsted to form the pattern of the fabric to be made is placed in the machine the table *i* is brought down to the platform *a* and the sockets *h*, *h* are removed from the sides of the table *i* so as to allow of the free action of the screws; without reference to the table. A presser head or platen *t*, *t* (see Figs. 3 and 5) is next placed in the machine on the top of the wool and the sockets *h*, *h*, previously attached to the table *i*, are next raised and fastened to the ends of this presser head, the upper ends of the copper and cloth sheets being laid down upon the top of the wool previous to the application of the presser head. On rotary motion being communicated to the screws the presser head (by reason of the screws taking into the thread on the inside of the sockets) will be brought down and made to compress the mass of woollen yarn or thread into a proper consistency. The next operation is to cause the ends of the woollen yarn to protrude a certain distance from the front of the machine so that the cement of india rubber or other adhesive substance may be applied. This forward motion is effected by the advance of the back board *u*, a number of screws *v*, *v*, (which have their bearings in

sockets in the back of the machine being made to rotate simultaneously and press against the back board. The mode of actuating the screws which I have shown in the drawings, is by passing a chain *w*, (denoted in Fig. 1 by a red line) over a tooth wheel *x* keyed to the shaft of each of the screws, *v*, *v*, *v*. In this case the screw *v'* must have a reverse thread to the others.

10 The copper sheets serve to reduce the friction of the wool in passing out of the machine when the pressure of the back board is applied. It will be obvious to any practical mechanic that various plans may be devised for forcing forward the wool, in an even and uniform manner but to this as well as the mode of cementing the threads to the cloth or fabric which is to form the back of the rug or carpet I lay no claim as such

20 part of the process may be performed in the way heretofore practiced. After the cementing has been effected and the fabric is ready to be cut off, the machine is advanced along the railway in order to bring the wool which stands out from the machine into contact with a large rotary knife, *u'*, (see Fig. 5,) mounted in an iron framing *v'*. By this means a slice of wool will be cut off from the main body of the threads the machine being made to advance gradually and

30 pass the face of the wool against the edge

of the knife. The fabric as it is cut off by the rotary knife is wound up by one or more vertical rollers, suitably arranged and operated, and may then be taken away to be shorn if thought desirable.

Having now described the nature of my invention and the manner of carrying out my improvements in the manufacture of carpets, rugs, and piled fabrics, I wish it to be understood that I lay no claim to the mode herein described of pushing out the wool from the machine nor to the cementing of the same to the fabric which forms the back of the rug or carpet; but

That which I claim is—

The hereinbefore described mode or process of combining or arranging, together, and in the pile the threads or yarns composing the figure or figures, the same consisting in winding the said threads on a beam or roller, by the aid of a collar, pattern and index and other contrivances essentially as specified, and cutting the said threads and transferring them on and by means of the roller to the pile in the machine in which they are compressed, cemented and cut, all as hereinbefore explained.

JAS. TAYLOR.

Witnesses:

WILLIAM McLEOD, Jr.,
JOSEPH COWDIN.