

(No Model.)

3 Sheets—Sheet 1.

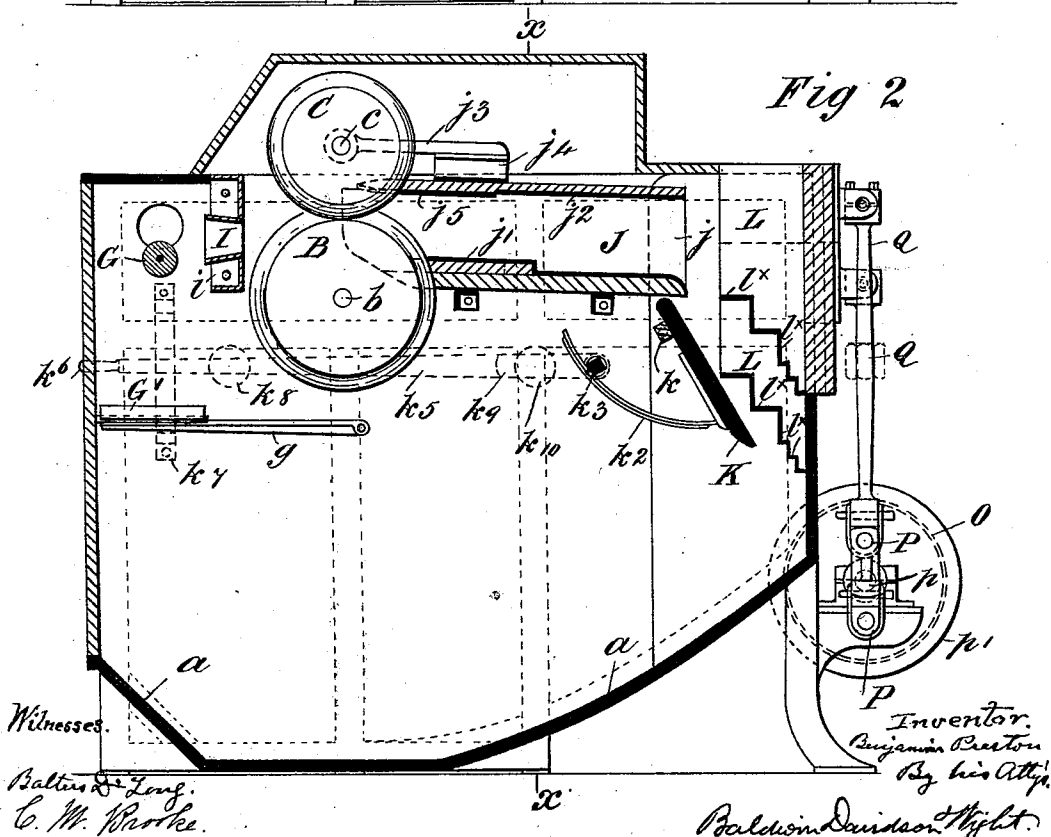
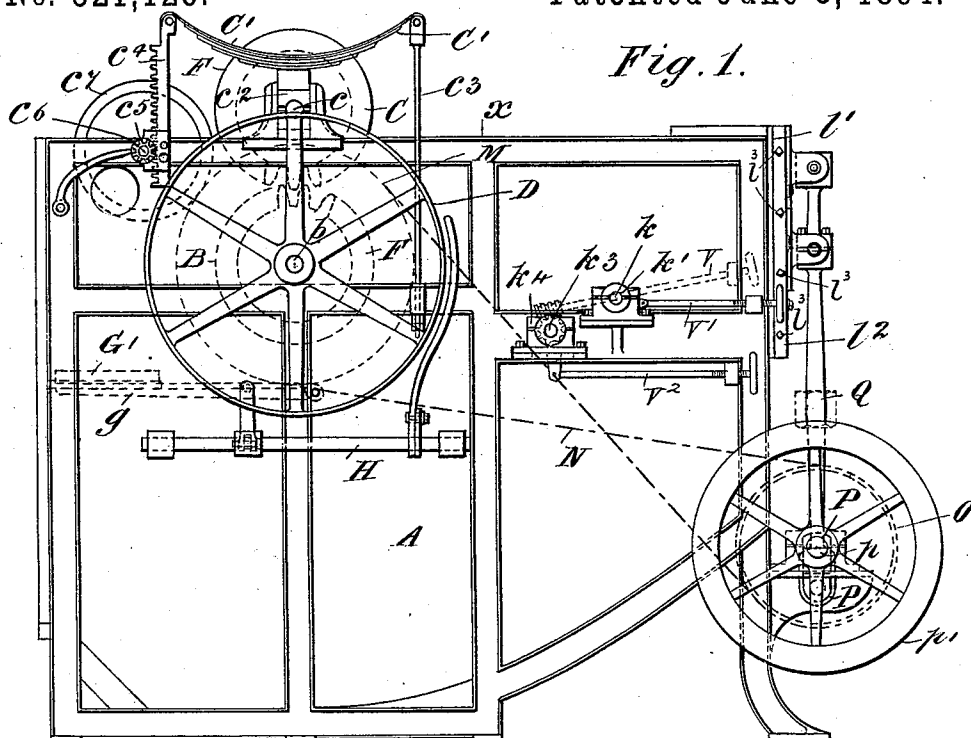
B. PRESTON, Dec'd.

W. D. BALDWIN, Administrator.

MILLING AND FULLING MACHINE.

No. 521,126.

Patented June 5, 1894.



Witnesses.

Baltus & Long.
C. W. Brooke.

Inventor.
B. Preston
By his Att'y.
Baldwin Davidson & Hight.

B. PRESTON, Dec'd.

W. D. BALDWIN, Administrator.

MILLING AND FULLING MACHINE.

No. 521,126.

Patented June 5, 1894.

Fig. 3.

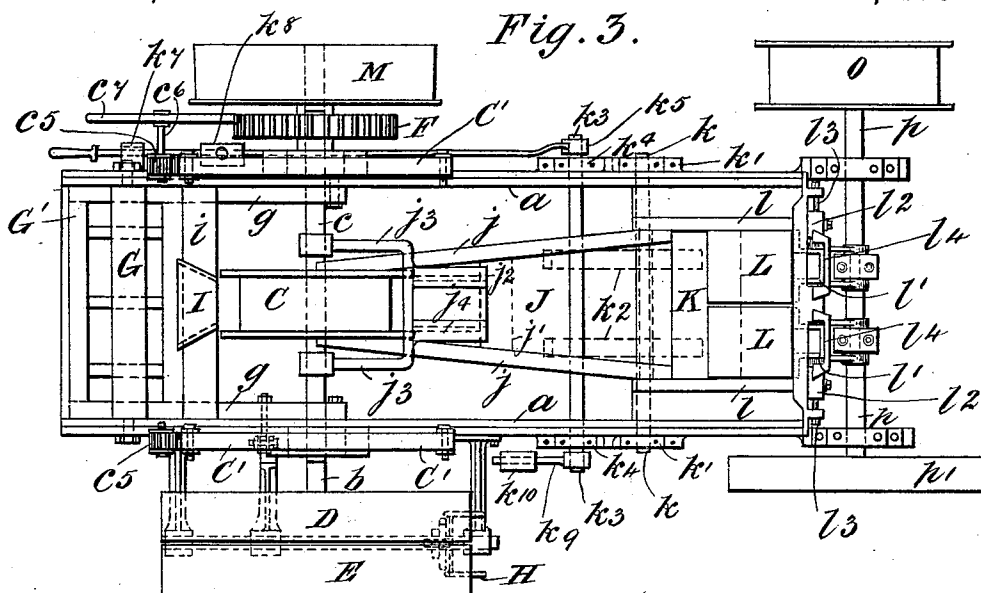
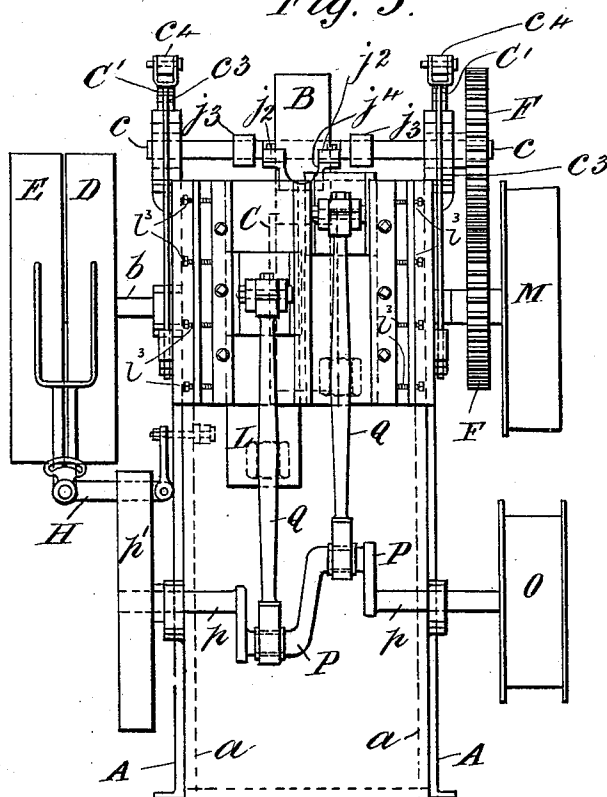


Fig. 5.



Witnesses:
Baltus de Long.
C. M. Brooke.

Inventor:
Benjamin Preston,
By his Attys.
Baldwin, Davidson & Wright.

B. PRESTON, Dec'd.

W. D. BALDWIN, Administrator.

MILLING AND FULLING MACHINE.

No. 521,126.

Patented June 5, 1894.

Fig. 4.

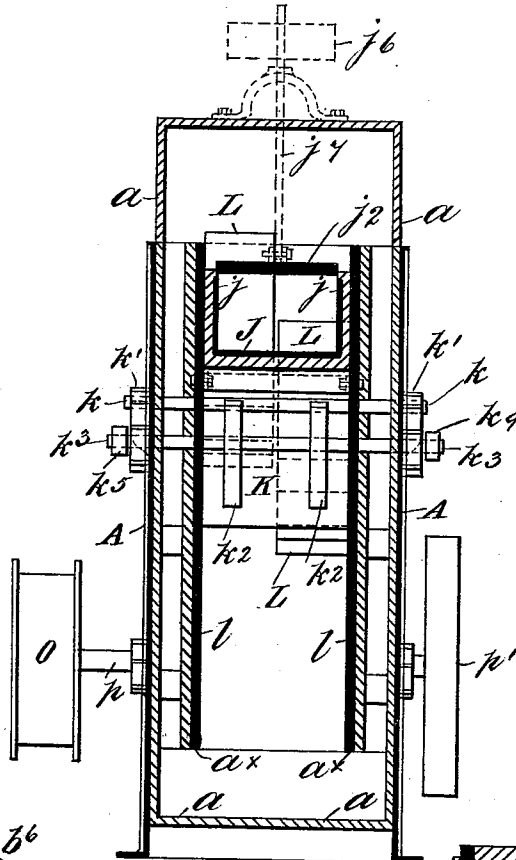
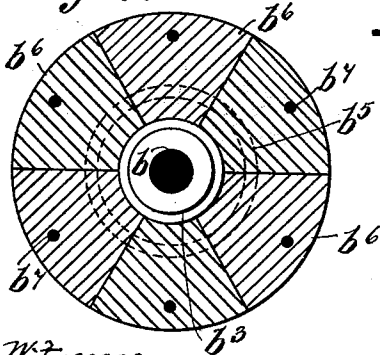
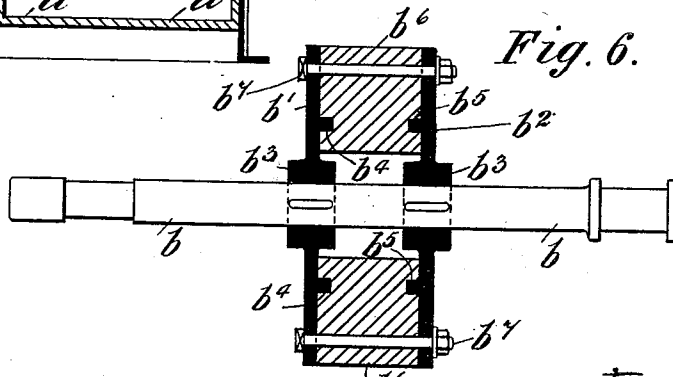


Fig. 7.



Witnesses
Balthus & Son.
C. M. Brooke

Fig. 6.



Inventor,
Benjamin Preston
By his Atty.
Baldwin, Davidson & Wright.

UNITED STATES PATENT OFFICE.

BENJAMIN PRESTON, OF BATLEY, ENGLAND; WILLIAM D. BALDWIN, ADMINISTRATOR, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO HANNAH PRESTON, OF BATLEY, ENGLAND.

MILLING AND FULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,126, dated June 5, 1894.

Application filed August 18, 1892. Serial No. 443,415. (No model.) Patented in England February 24, 1891, No. 3,310, and March 15, 1892, No. 5,123, and in France December 10, 1891, No. 217,976.

To all whom it may concern:

Be it known that I, BENJAMIN PRESTON, a subject of the Queen of Great Britain, residing at Batley, in the county of York, England, have invented new and useful Improvements in Milling and Fulling Machines, (for which I have obtained Letters Patent in the following countries, namely: Great Britain, No. 3,310, dated February 24, 1891, and No. 5,123, dated March 15, 1892, and France, No. 217,976, dated December 10, 1891,) of which the following is a specification.

The object of my invention is to combine the operations of milling and fulling woolen or other woven or felted fabrics, whereby such operations are facilitated, as well as the cost of manufacture and material reduced.

I accordingly employ an ordinary milling machine through which the material is passed in the ordinary way, but at the end of each spout of the milling machine I employ a fulling stock. Between the foot or feet of one or more stocks and a bed the material is passed, and in so doing the desired effect is produced similar to that in an ordinary fulling stock, and this simultaneously with the milling operation. The feet reciprocate in a vertical direction in suitable slides provided on the machine, and are operated by suitable cranks or eccentrics actuated by some suitable motor. I attain these objects by the mechanism set forth in the annexed drawings, in which—

Figure 1 is a front elevation, Fig. 2. a longitudinal section; Fig. 3. a plan looking at the top with the covering removed; Fig. 4. a transverse section on line *x. x* Fig. 2, and Fig. 5. an end elevation. Figs. 6 and 7 are respectively a part longitudinal elevation and a transverse section of a fulling roller constructed according to my invention.

Like parts in all the views are marked with the same letters of reference.

A is the framework of the machine which is lined with earthenware, marble, porcelain, or wood, or with two or more of them combined as shown at *a*.

B and C are milling rollers carried in suitable bearings on the framework. To the milling rollers a rotary motion is imparted

from any suitable source of power through driving pulley D (pulley E being arranged to revolve loosely on the end of shaft *b*) and spur gearing F.

G is a guide roller, and G' the knocking off board mounted on levers *g. g* pivoted to the lining *a* and connected with the belt shipping mechanism H in the ordinary way. I is the mouthpiece mounted in framework *i* in front of the milling rollers.

All the above parts, except the earthenware, or marble, or porcelain lining of the milling portion of the machine, may be of ordinary construction, and they are mounted or fixed to the framework A or lining *a* in the usual manner.

Instead of making the conducting spout J at the rear of the rollers B and C with sides *j. j* parallel to each other, as is usually done in "milling" machines of ordinary construction I preferably, though not necessarily so, make them to taper outward as shown at Fig. 3 (and line them with earthenware, or marble, or porcelain) to allow the material operated upon to open out during its passage from the rollers B and C to the "fulling" stocks (to be hereinafter described), thus presenting a greater surface of material to the action of the stocks. The bottom of the spout J is armed with a tongue *j'* which may be made at one end to fit the flanges, when such are used, of the roller B, and at the other end to fit between the sides *j. j* of the spout. The tongue may be made of wood, earthenware, marble, porcelain or the like. Within the spout is also mounted so as to work freely between its sides *j. j* a tapering pressure board or lid *j²*. This board *j²* is attached by a casting *j⁴* to the levers *j³ j³* jointed on the shaft *c* as shown at Figs. 2, 3 and 5, and the inner surface of its narrow end may be armed with a brass, earthenware, marble, porcelain, or other plate *j⁵*. When it is required to impart a given amount of pressure to the material as it passes through the spout, the board *j²* may be weighted by any desired number of weights *j⁶* fixed on a vertical rod *j⁷* jointed to the upper surface of the board as shown in dotted lines at Fig. 4.

The required pressure is imparted to the "milling" rollers B and C by the flat springs C' C' in the following manner namely:—Between the ends of the milling roller shaft *e* and the springs C' is inserted a metal bush *c*³ as at present,—but instead of connecting both ends of the springs C' C' to the framework by rods such as *c*³ (as is usually done) I fix to the front end of each spring a rack *c*⁴. Each rack is made to engage with a spur pinion *c*⁵ mounted on a shaft *c*⁶ which is carried in suitable bearings formed for its reception in the framework of the machine. On the shaft *c*⁶ is also mounted a hand wheel *c*⁷ for rotating the said shaft whereby the pressure of both springs C' C' may be adjusted simultaneously.

Below the rear end of the spout J and at a suitable distance, say about two or more inches therefrom is mounted an adjustable bed K which may or may not be lined with earthenware, marble, porcelain or the like. The bed is constructed as follows:—On a horizontal shaft *k* (carried on adjustable bearings *k*¹, mounted on the framework A) is mounted a swinging wooden board or other bed K (which may or may not be lined on its face with earthenware, marble or porcelain) which is held in position as well as elastically cushioned by the flat springs *k*² *k*² mounted on a second horizontal shaft *k*³ (carried in fixed or adjustable bearings *k*⁴ *k*⁴ on the framework A) at a suitable distance say about nine inches between the centers from the first named shaft *k* in such a manner that one of the ends of each spring bears against the inner side of the bed K as shown at Fig. 3. On one side of the shaft *k*³ is fixed the lever *k*⁵ provided with a handle *k*⁶ which works between a slotted guide *k*⁷ attached to the side of the framework A, whereby the bed K may be moved, by the attendant from the front of the machine, radially nearer to or farther from the stock feet as the material operated upon requires. The handle lever *k*⁵ may be held in the required position in the slotted guide *k*⁷ by means of a pin. A weight *k*⁸ may also be mounted on the lever *k*⁵ and fixed in any desired position thereon by means of a set screw. Or the bed K may be moved to or from the stock feet by means of a rack or pinion and worm and wheel actuated by a hand wheel and horizontal shaft. On the opposite end of shaft *k*³ is also fixed a short lever *k*⁹ armed with an adjustable weight *k*¹⁰ for aiding in keeping the bed up to its work. When the shafts *k* *k*³ are mounted in adjustable bearings on the framework A, the bed K may be adjusted longitudinally as well as radially.

In Fig. 1, means are shown for adjusting the bearings of the shaft, above referred to, V, V', V² respectively representing devices of well-known construction for moving the bearings, or for turning the shaft *k*³, to adjust the bed K.

At the rear end of the spout J and at a suit-

able distance—say about three or four inches (more or less) therefrom—are arranged the stock feet L L which may or may not be lined at *l*^x with earthenware, marble, porcelain, or the like. In the drawings two stock feet are shown constructed, that is stepped at their lower and inner ends somewhat similar to the feet of fulling stocks now in use. The stock feet L L are arranged to reciprocate in a vertical direction. The stock feet work between the vertical guides (or shell) *ll* which are made to extend downward from the top of the framework A till they meet the inner lining *a* at *a*^x, and from the back of the machine in a horizontal forward direction for say about eighteen or twenty inches; that is to say the sides *ll* are about eighteen or twenty inches wide so as to receive not only the rear end of the spout J, but also to permit of the bed K working freely between the said guides. The stock feet L L are attached to the guide pieces *l*¹ *l*¹ (which work in the V slides and are capable of adjustment horizontally by means of the loose slips *l*² *l*² and set screws *l*³ *l*³) by means of the blocks *l*⁴ *l*⁴. A vertical reciprocating motion is imparted to the guide pieces *l*¹ *l*¹ and stock feet from pulley M on shaft *b* through belting N, pulley O, (on crank shaft *p* carrying at its opposite end a fly wheel *p*¹) cranks P P and adjustable or other connecting rods Q Q. When desired, instead of the cranks P P eccentrics or their equivalents may be employed. The material after leaving the spout J passes between the bed K and the stock feet and in so doing the desired effect on the material is produced similar to that in an ordinary pulling stock, and this simultaneously with the milling operation thus saving not only the time required to remove the material operated upon from machine to machine, but also permitting of the two operations being performed in or about the same time as it usually takes to perform the "milling or fulling" operation alone. After the "milling and fulling" operations have been performed, the material may when desired, also be scoured before it is removed from the machine, by providing pipes to convey and admit the water and other scouring materials on to the material as it passes between the bed K and the stock feet L L.

I would have it understood that although I have shown two stock feet L L this number may when desired, be increased or diminished, also any of the dimensions herein given may be altered or varied as circumstances require.

The rollers B and C may be constructed as shown at Figs. 6 and 7.

On the shaft *b* are mounted and keyed at a suitable distance apart two disks or plates *b*¹ *b*² provided with hubs *b*³ and annular rings *b*⁴ *b*⁵. Between the two disks *b*¹ *b*² are inserted any desired number of segments *b*⁶ (six are shown in the drawings but this number may be increased or diminished as required) made endwise of the grain. These segments

are bolted to the disks $b' b^2$ at b^7 and they are of such a length and thickness as to suit the diameter and width of the roller. The disks $b' b^2$ may or may not project beyond the periphery of the wood lagging or center portion of the roller, and they may or may not be lined with brass, earthenware, porcelain, marble, or the like to prevent them or the laggings wearing away at their edges. When the disks $b' b^2$ do not project beyond the periphery of the lagging b^6 the sides j of the spout J may be carried or prolonged to the center of the rollers B and C parallel therewith.

Having now particularly described and ascertained the nature of my said invention and in what manner the same may be carried into practice, I declare that what I claim is—

1. The combination, substantially as hereinbefore set forth, of a casing, milling rolls contained within the casing, power-driven mechanism for operating the milling rolls, means for imparting the requisite drag upon the material, reciprocating stock-feet contained within the casing, power-driven mechanism for actuating them, and a bed interposed between the stock-feet and the milling rolls.

2. The combination of the milling rolls, the reciprocating stock-feet, the adjustable bed interposed between the milling rolls and the

stock-feet and co-operating with the stock-feet, a shaft carrying a spring for cushioning the bed, and means for adjusting the shaft and spring, substantially as set forth.

3. The combination of the milling rolls, the guide roll, the throat piece interposed between the milling rolls and the guide piece, the knock-off board, the vertically reciprocating stock feet, and the tapered spout interposed between the stock feet and the milling rolls.

4. The combination of the milling rolls, the vertically reciprocating stock feet, the tapered spout interposed between the stock feet and the milling rolls and having its larger end next the stock feet, and the adjustable bed, interposed between the spout and the stock feet.

5. The combination of the milling rolls, the stock feet, a spout interposed between the milling rolls and the stock feet, and an adjustable bed, interposed between the stock feet and the spout.

In testimony whereof I have hereunto signed my name to this specification in presence of two subscribing witnesses.

BENJAMIN PRESTON.

Witnesses:

W. FAIRBURN-HART,
ADAM C. HART.