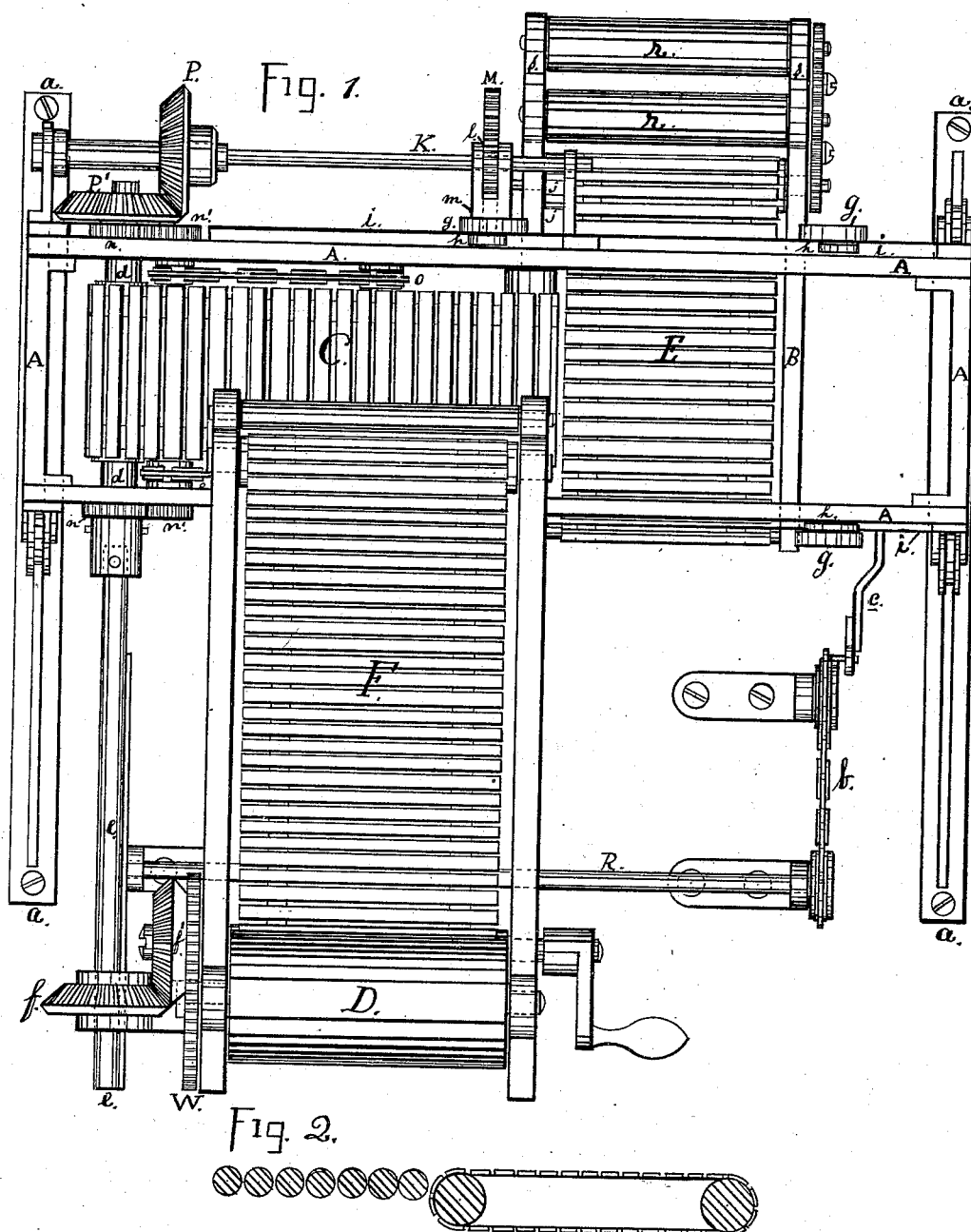


J. STAFFORD.
Lapping-Machine.
No. 214,794. Patented April 29, 1879.



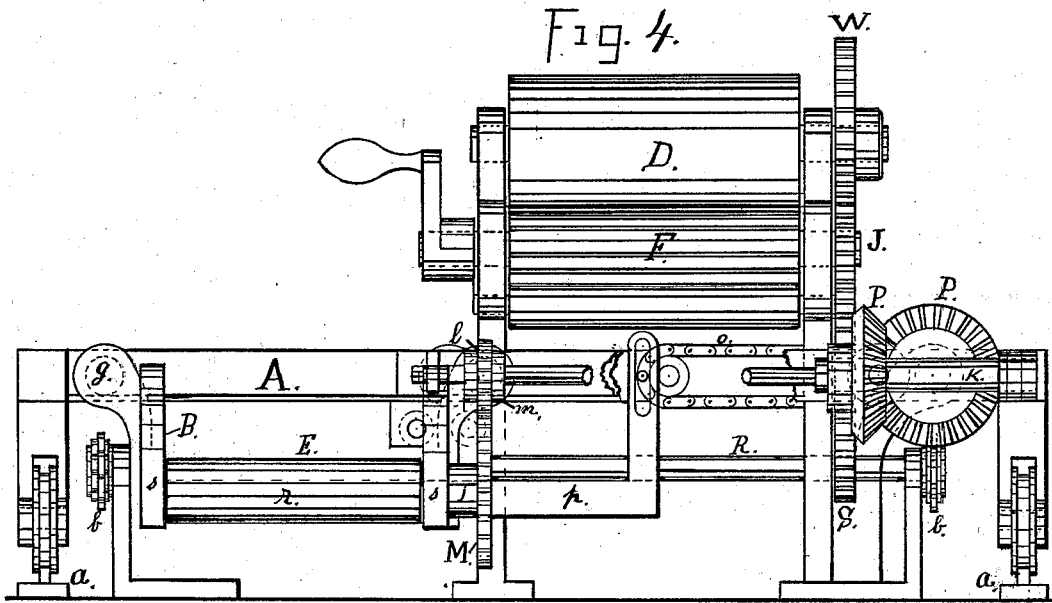
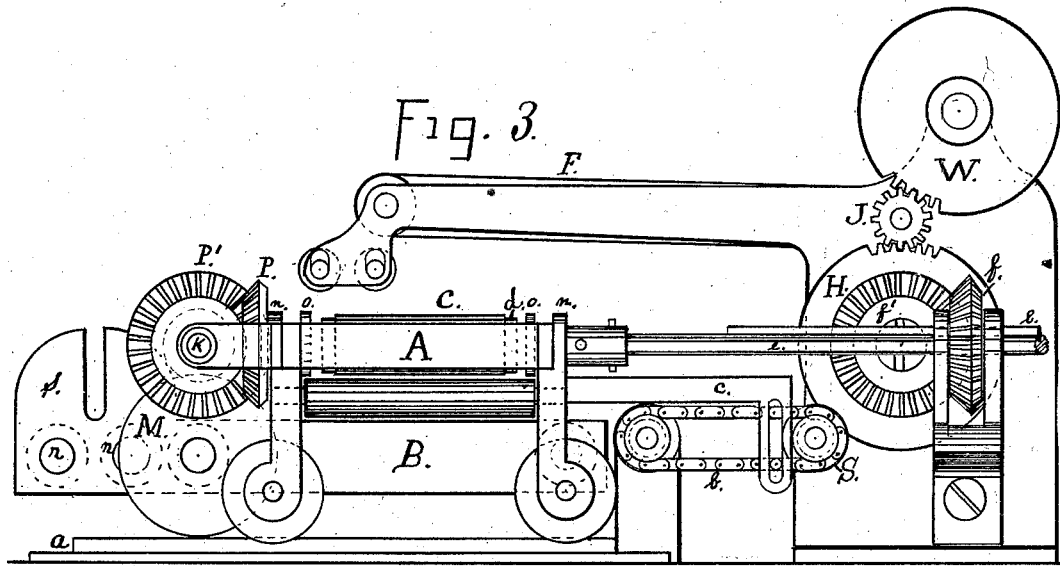
WITNESSES.
James Shaw
James P. Traz

INVENTOR.
James Stafford
By John H. M. Attorney

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WITNESSES.
James Shaw
James P. Gray

INVENTOR.
James Stafford.
By John H. Smith, Attorney.

UNITED STATES PATENT OFFICE.

JAMES STAFFORD, OF MANAYUNK, PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN LAPPING-MACHINES.

Specification forming part of Letters Patent No. **214,794**, dated April 29, 1879; application filed February 20, 1879.

To all whom it may concern:

Be it known that I, JAMES STAFFORD, of Manayunk, in the city of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Lapping or Doubling and Lapping Machines applicable to Carding-Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification.

My invention relates to an improvement in machinery for taking the partially-carded fibrous substances (such as wool, cotton, flax, jute, &c.) from a first, second, or other breaker-card as it is delivered by the doffer, double, cross, redouble, and recross, and wind it in a roll or on a roller, forming a lap, in which form the sheet, bat, or web of fibers is fed to another breaker or condenser card, with the fibers endwise or lengthwise, the same as when taken from the doffer in the first place.

The object of my improvement is to get evenness of lap, with fibers endwise or lengthwise, after a series of crossings and doublings, in doing which I dispense with the well known "camel-back lapper." I take the fibrous substances from the doffer, double and cross into a sheet or web of manifold layers of any width, then redouble and recross the same in manifold layers of any width and thickness, and roll the sheet, bat, or web into a roll or lap, so that the carded fibers will be lengthwise or endwise. The continued crossing, doubling, and recrossing and redoubling enables me to make a more even web, bat, or sheet, which, being fed to another breaker or condenser card, will produce stronger and more even slubbings, from which may be spun better and stronger yarn from the same materials than when the lap or web is fed to the condenser with the fibers crosswise, as is the case with some lapping-machines.

The invention consists in a combination and arrangement, with the doffer and delivery-apron of a breaker-card, of two reciprocating carriages with traveling and rotating endless aprons, and rotating rollers, and mechanism for reciprocating the carriages positively, whereby the fibers composing the lap are taken from the doffer of the breaker-card endwise,

doubled, crossed, redoubled, and recrossed to a uniform width and thickness, and then wound into a roll or lap with the fibers endwise, as will be hereinafter described, referring to the annexed drawings, in which—

Figure 1 is a top view of my improved lapping-machine, which shows the doffer of the card. Fig. 2 is a sectional view of an apron and a series of rollers combined for carrying the fibers. Fig. 3 is a side view of the machine shown in Fig. 1. Fig. 4 is a front view of the same.

Similar letters of reference in the drawings indicate like parts.

The construction of my improved lapping-machine is as follows: A represents a carriage mounted on four grooved wheels. These wheels run on a track, *a*, laid on the floor, as shown in the drawings. The carriage A is connected to two endless chains, *b b*, by two arms, *c*. (One only is shown in the drawings.) To the carriage A is fitted a traveling apron, C, formed of slats. This apron is mounted on two rollers, of which roller *d* is the driver. This roller *d* is connected to the shaft *e*, which shaft passes through the bevel or miter wheel *f*. The shaft *e* has fitted in it a feather, and the wheel *f* a corresponding slot or keyway for the feather.

B represents a carriage, which is suspended to the carriage A by four arms, *g*. To each arm is fitted a small wheel, *h*. These wheels run on a track or ledge, *i i*, on the sides of carriage A. The carriage B is fitted with a traveling slat-apron, E. This apron is mounted on two rollers, of which roller *j* is the driver, and is geared by wheel M and pinion *l* to the shaft K, in which shaft is cut a slot for a feather, which feather is fixed in the pinion *l*. This pinion *l* is fitted to work in a yoke, *m*, fastened to one of the arms *g*. This yoke causes the pinion *l* to travel with the carriage B. The shaft K is supported by two stands fastened to frame of carriage A. On one end is a bevel or miter wheel, P, which gears into a corresponding wheel, P', on the end of roller *d*. On roller *d*, outside the frame of carriage A, are wheels *n n*, which gear into similar wheels *n' n'*. These last wheels *n' n'* are fastened to studs which pass through the frame of carriage A. To these studs, on the inside

of the frame, are the chain-wheels, which carry and operate the chains *o o*. *p* is an elbow-arm, connected with the carriage B. At its end is a slot, in which fits a pin in the chain *o*. (See Fig. 4.) Two of these arms are connected to carriage B; but only one is shown in the drawings.

The carriage B is provided with two rollers, *r r*, and the frame is formed with projecting and slotted flanges *s s*, in which slots fit the journals of a roller, upon which is lapped the sheet or bat of carded fibers. The rollers *r r* are geared by spur-gearing, as is usual on lapping-machines.

Fig. 2 of the drawings shows an arrangement of a short slatted apron combined with a series of small rollers. These rollers may be made of wood or tin; but they must be geared to drive all in the direction in which the apron moves. This style of apron and rollers is not new, but is well known to carders. (See Patent No. 164,796, June 22, 1875.)

The operation of my improvement is as follows: D is supposed to be the doffer of a first or second breaker-card; F, the traveling apron that receives the carded fibers from the doffer D. On the end of the doffer-shaft is fixed a wheel, W, which gears into a pinion, J, on the end of the roller that drives the apron F. The pinion J gears into a wheel, H, to which is fastened a bevel or miter wheel, *f'*, which gears and drives wheel *f* and shaft *e*. The wheel H gears a small pinion, S, on shaft R, on which shaft is fastened the chain-wheels that operate the chains *b b*, which, in turn, operate the carriage A, and give it a backward and forward movement, as is well understood by those who are skilled in the arts to which this invention belongs.

As before stated, the shaft *e* drives roller *d*, and by it, through the gears *n n* and *n' n'*, the chains *o o* are operated, and they in turn operate the carriage B, and give it a backward and forward movement at right angles to the movements of carriage A.

The roller *d*, by the miter-wheel P, drives the miter-wheel P' and shaft K; and this shaft, through the traveling pinion *l* and the wheel M, drives the roller *j*, and it the apron E and rollers *r r*.

To the doffer D of a carding-machine, called a "breaker-card," is attached a traveling apron, F, operated in the usual manner, which receives the sheet of fibers from doffer D, carries it forward, and deposits it on the traveling apron C of the reciprocating carriage A, which reciprocating carriage A travels transverse to its length underneath the traveling apron F, which, by the backward and forward movement of reciprocating carriage A, containing traveling apron C, rotating at right angles to the reciprocating motion of carriage A, and also at right angles to the rotary motion of traveling apron F, receives the sheet of fibers, and spreads it layer upon layer into a bat, with the fibers crosswise or sidewise to

the rotary motion of traveling apron C, on which it is formed. This bat is then carried forward and deposited on the traveling apron E in the reciprocating carriage B, which reciprocating carriage B travels backward and forward transverse to its length underneath and suspended to and upon the reciprocating carriage A, the traveling apron E rotating at right angles to the backward and forward motion of its reciprocating carriage B, and at right angles to the rotary motion of traveling apron C in the reciprocating carriage A, spreading it layer upon layer upon the traveling apron E in an even, uniform bat, with the fibers endwise or lengthwise to the rotary motion of the traveling apron E, on which it is formed into a bat. Then it is carried forward to the rotary rollers *r r*, and by them wound up into a lap with the fibers lengthwise.

It is understood that the apron F runs three times as fast as apron C, and apron C three times as fast as apron E. This will make the bat of fibers on apron C three layers thick, and the bat on apron E will be nine layers thick.

It is obvious that the speeds and gears of the carriages and aprons can be arranged to give such numbers of layers on each apron as may be desired.

It is also obvious that the carriages and aprons of A and B may be made to make the bat of such width as may be desired; and it is plain that if the fibers are laid crosswise on apron C, when delivered to apron E they will be laid on that apron lengthwise, and in that manner rolled into a lap.

The apron or rollers in carriage A receive the sheet or web, and cross and double it to any width and thickness, with fibers crosswise. The apron or rollers in carriage B then take the sheet or web, and, by doubling and crossing, bring the fibers straight or endwise, as when taken from the doffer in the first place. The sheet or web of fibers is then rolled in a lap on carriage B.

The above-described arrangement of gearing for operating the carriages and aprons may be modified, and I do not claim it as any part of my invention, and the parts shown separately I do not claim; but

I claim as my invention—

The combination, substantially as described, of two reciprocating carriages, A and B, provided with means for operating the same, and endless aprons C and E, with the doffer D, and endless apron F, and rollers *r*, whereby the fibers composing the lap are taken from the doffer D of a breaker-card endwise, doubled, crossed, redoubled, and recrossed to a uniform width and thickness, and then wound into a roll or lap with fibers endwise, as and for the purpose set forth.

JAMES STAFFORD.

Witnesses:

JOHN SHINN,
E. H. BAILEY.