3 Sheets—Sheet 1.

R. CATLOW.

Cotton-Batting Folding Machines.

No. 195,884. Patented Oct. 9, 1877.

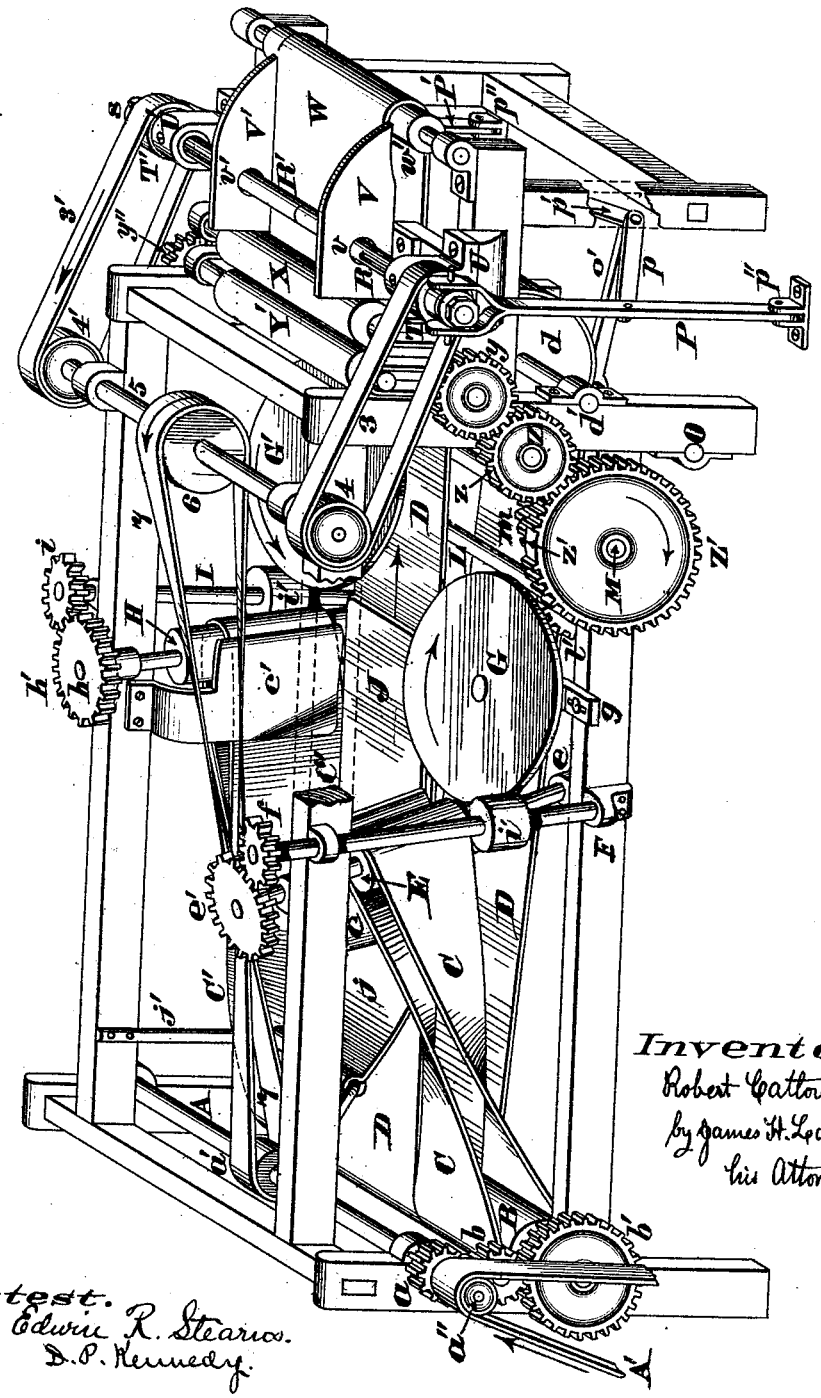

FIG. 1.

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his Attorney.

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D. P. Kennedy.

3 Sheets—Sheet 2.

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FIG. 2.

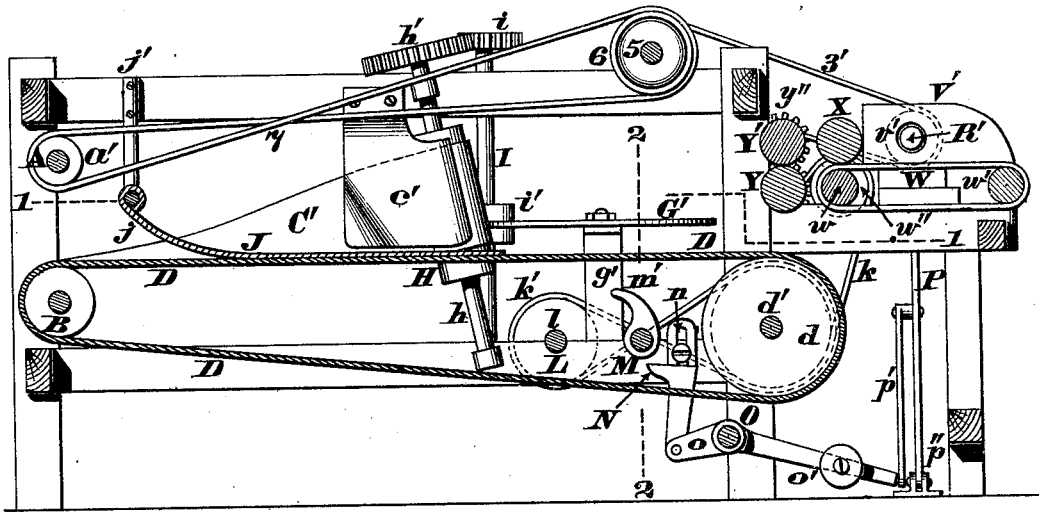

FIG. 3.

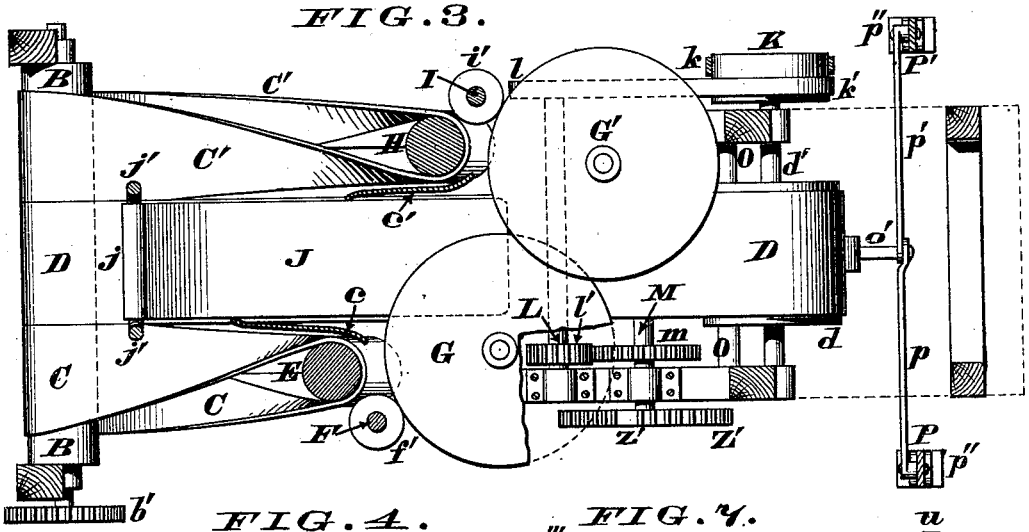

FIG. 4.

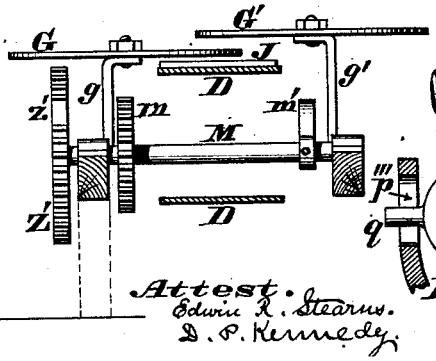

FIG. 4.

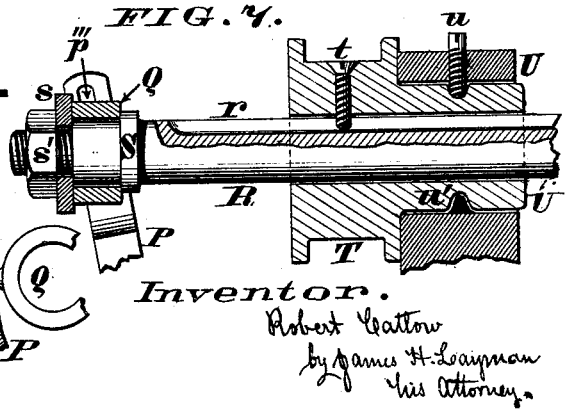

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FIG. 5.

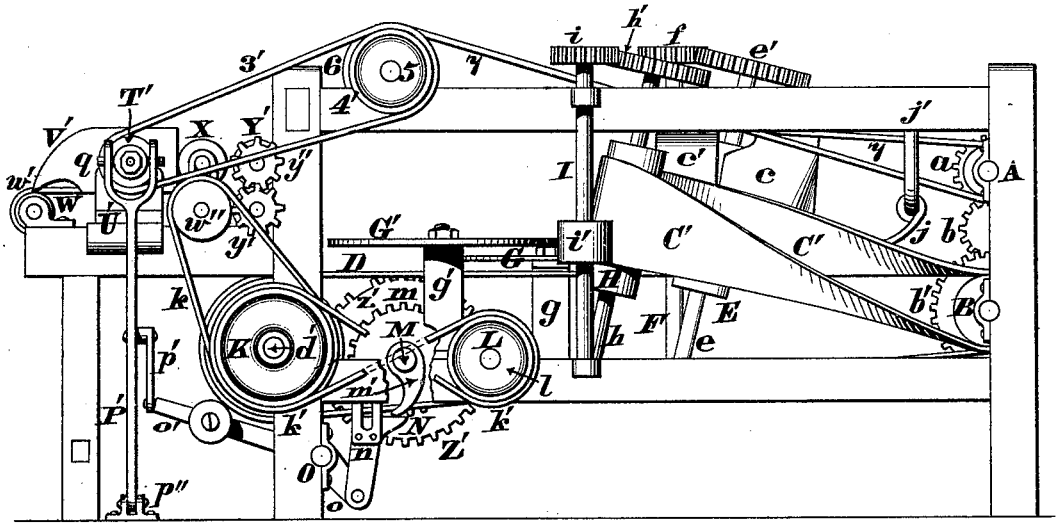

FIG. 6.

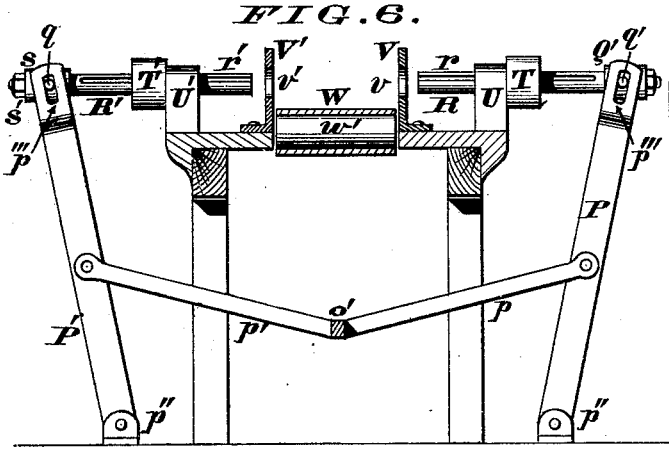

FIG. 9.

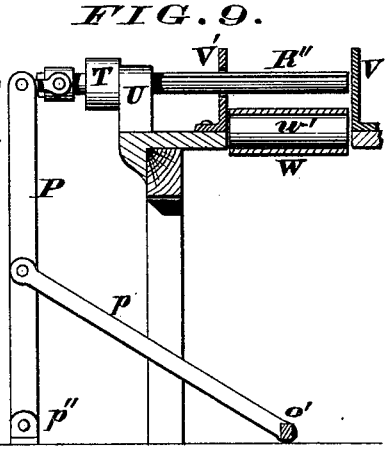

FIG. 8.

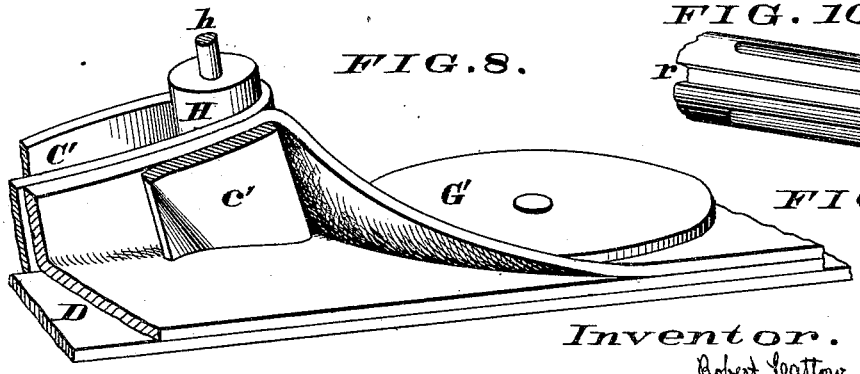

FIG. 10.

FIG. 11.

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UNITED STATES PATENT OFFICE.

ROBERT CATLOW, OF CINCINNATI, OHIO, ASSIGNOR TO STEARNS & FOSTER, OF SAME PLACE.

IMPROVEMENT IN COTTON-BATTING-FOLDING MACHINES.

Specification forming part of Letters Patent No. **195,884**, dated October 9, 1877; application filed July 2, 1877.

To all whom it may concern:

Be it known that I, ROBERT CATLOW, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Cotton-Batting-Folding Machines, of which the following is a specification:

My invention comprises a machine which receives the "cotton web" directly from the "cards," and turns down successively the two opposite edges of said web, so as to produce three thicknesses of material. The web, in this threefold condition, is then wound upon a spindle, or a pair of spindles, so as to produce a batting of any desired weight, and as soon as sufficient material has been coiled upon said spindles, the web is then severed transversely by the momentary stoppage of some of the feeding devices of the machine. Immediately after this parting of the web the spindles are retracted from the coiled batting, and the batting is then delivered from the machine and inclosed in a suitable wrapper.

The above-described operations of folding and severing the web and disengaging the spindles from the batting are effected automatically by special appliances, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a perspective view of my improved cotton-batting machine, a portion of the frame being broken away. Fig. 2 is a longitudinal section of the same. Fig. 3 is a horizontal section at the line 1 1 of Fig. 2. Fig. 4 is a transverse section at the line 2 2 of Fig. 2. Fig. 5 is a side elevation of the machine. Fig. 6 is a transverse section, showing the spindles retracted. Fig. 7 is an enlarged longitudinal section of one of the spindles and its accessories. Fig. 8 is a perspective view of a modification of the machine. Fig. 9 is a transverse section of the machine as constructed with one spindle. Diagrams 10 and 11 represent modifications of the spindle.

Journaled in any suitable frame, and located at the receiving end of the machine, is the driving-shaft A, carrying a pinion, *a*, and two pulleys, *a' a''*, around which latter pulley, *a''*, is passed the belt A', that communicates with any convenient motor. *b* is a pinion that communicates motion from pinion *a* to the gear-wheel *b'* of a drum or roller, B, around which latter three endless bands or belts, C C' D, are passed. Of these belts the central one, D, constitutes the horizontal conveyer for the web, while the two outer bands, C C', act as edge-turners for the fabric.

The horizontal conveyer D serves also to drive a drum, *d*, whose shaft *d'* is located near the delivery end of the machine.

The edge-turner C is passed around a roller, E, whose shaft *e* is nearly vertical, and carries at its upper end a wheel, *e'*, that gears with the pinion *f* of shaft F, the latter being provided with a friction-wheel, *f'*. Driven by contact with this friction-wheel is a disk, G, whose bearing *g* may be adjusted so as to shift said disk toward or away from the center of the machine; or, if preferred, this disk and the one G' may be driven with gearing or belts, or otherwise.

Secured to the main frame, and located near roller E, is a plate, *c*, which coacts with belt C in turning up the right edge of the web as the latter advances upon the conveyer D. The opposite edge-turner C' is passed around the roller H of inclined shaft *h*, having a wheel, *h'*, at its upper end, which wheel gears with pinion *i* of shaft I, the latter being provided with a friction-wheel, *i'*. Driven by contact with this friction-wheel is a disk, G', whose bearing *g'* may be shifted in the same manner as the bearing *g* previously described.

Secured to the main frame, and located near roller H, is a plate, *c'*, that coacts with belt C' in turning up the left edge of the web.

Disposed longitudinally of the machine, and parallel with conveyer D, is a long flat plate, J, whose rear end is bent up at *j*, and is secured to the main frame with rods *j'*.

The object of this extended plate is to hold the central portion of the web evenly upon conveyer D, and at the same time to produce sufficient friction to cause the web to move with said conveyer in the direction indicated by arrows in Fig. 1.

Secured to shaft *d'* is a pulley, K, that imparts motion to a straight belt, *k*, and a crossed belt, *k'*, which latter drives the pulley *l* of shaft L, whose pinion *l'* gears with wheel *m* of shaft M. This shaft carries a cam, *m'*, which is

adapted at every revolution of said shaft to come in contact with a vertically-reciprocating spur, N, that is coupled to the short arm *o* of rock-shaft O.

Spur N is confined to a vertical path by the slotted guide *n*. Rock-shaft O is provided with a long arm, *o'*, whose free end is coupled to a pair of links, *p p'*, which latter are pivoted, respectively, to the vibrating rods P P'.

The lower ends of these rods are hinged to the floor, or to the sills of the machine, at *p''*, while the upper ends of said rods are slotted at *p'''*, as more clearly seen in Figs. 6 and 7.

Traversing these slots are lugs or pins *q q'* of rings Q Q', which latter surround the spindles R R', and are maintained in position by collar S, washer *s*, and nut *s'*. These spindles R R' are grooved longitudinally at *r r'*, to receive pins or keys or tongues *t* of pulleys T T', whose necks or extended bearings *t'* are journaled in boxes U U', secured to the main frame of the machine.

Each box is provided with a pin, *u*, whose lower ends enter the annular grooves *w'* of pulley-bearings *t'*. By this arrangement free rotation of pulleys T T' is permitted, while at the same time said pulleys cannot be accidentally unshipped from the boxes U U'.

Spindles R R' traverse the apertures *v v'* of the fixed sides V V' of an apron, W, which latter is stretched around two rollers, *w w'*, Fig. 2, the one *w* being the driver. This driver has a pulley, *w''*, which is run from pulley K by the straight belt *k*, Fig. 5.

Located above driver *w* is a gravitating-roller, X, whose weight maintains the folded web snugly upon the apron W, said folded web being delivered onto the apron by two feeding-rollers, Y Y', Fig. 2, of which rollers the lower one, Y, has at one end a wheel, *y*, (see Fig. 1,) and at the other end a pinion, *y'*. (See Fig. 5.) This pinion gears with another pinion, *y''*, of the upper feeding-roller Y', which has a slight vertical play to compensate for any variations in the thickness of the web.

Wheel *y* gears with a wheel, Z, whose teeth are interrupted at *z*, said wheel being journaled upon a stud-shaft projecting from the main frame. Wheel Z gears with a master-wheel, Z', secured to the end of cam-shaft M, the teeth of said wheel being interrupted at *z'*. The spindle-pulleys T T' are driven, respectively, by belts 3 3', that pass around pulleys 4 4' of counter-shaft 5, whose central pulley 6 carries a cross-belt, 7, that extends to pulley *a'* of shaft A.

In arranging these belts 3 3', care must be taken not to draw them too tightly around the pulleys T T' and 4 4', or they will interfere with the proper action of the machine. Said belts should be slack enough to slip as the batting is wound upon the spindles, and thereby compensate for the gradually-increasing diameter of the coil. Furthermore, the tension of these belts may be regulated so as to wind the batting more or less loosely upon the spindles R R'.

The operation of my machine is as follows: Driving-shaft A is rotated so as to compel the web to travel from drum B toward cylinder *d* at any suitable speed; and as the web advances through the machine the central portion of the fabric is maintained in contact with the upper surface of conveyer D, and is kept level and smooth on the same by the extended plate J, whose curved extremity *j* facilitates the entrance of said web. As the right edge of the web rests upon the twisted belt C, it is evident this portion of the fabric will be gradually deflected and bent upwardly as it passes between said belt and plate *c*; and when roller E is reached, said edge of the web will be vertical or nearly vertical.

As soon as the web emerges from the passage between said roller and plate, it is then acted on by disk G, whose rotation in the direction of progress serves to bend the elevated edge over toward the center of the machine, and thus folds this upturned portion of the web down upon the part supported on conveyer D. These operations produce two thicknesses of material at the delivery end of plate J.

Meanwhile, the opposite or left edge of the web is being operated on in a precisely similar manner by the devices C' *c'* G'—that is to say, the belt C' and plate *c'* coact to elevate said left edge, while the disk G' bends the upturned portion over toward the center of the machine, thereby producing three thicknesses of material near the delivery end of conveyer D.

By referring to Fig. 3, it will be noticed that the devices *c'* G' are located somewhat nearer the delivery end of the machine than are the other edge-turners *c* G, and, consequently, the first fold is bent down upon the central portion of the web before the second fold is superimposed upon the first one.

By this arrangement any interference of the two folds is prevented, and each fold is disposed in the most level and uniform way.

The web is now composed of three thicknesses of material, and it is in this condition that the fabric is delivered from conveyer D, and passes in between the feeding-rollers Y Y', which rollers conduct the web onto apron W. About the time the web begins to traverse this apron the rotation of shaft M brings its cam *m'* in contact with spur N, so as to rock the shaft O in its bearings, and elevate its long arm *o'*, which elevation of said arm causes a separation of spindles R R', as seen in Fig. 6. This separation of said spindles is but for a moment, or only as long as spur N is subjected to the pressure of cam *m'*, and the instant this pressure is removed the weight of attachments *o' p p'* restores said spindles to their normal or closed position. During these opening and closing movements of the spindles the end of the web has advanced far enough to be about in line with the openings *v v'*, and as the ends of said spindles approach each other they gripe or clamp the web between them.

Now, as these spindles revolve in the direc-

tion indicated by arrow on belt 3′ in Fig. 1, it is apparent the clamped web must partake of the rotary movement of said spindles, and, consequently, the web is coiled around them, the apron W yielding as the coil increases in diameter.

It is evident the speed of the spindles must be diminished in exact proportion to this increased diameter of the coil, or otherwise the web would be torn asunder; but the slackness of belts 3 3′ allows sufficient slip or lost motion to compensate for the gradually-increasing coil.

As soon as sufficient material has been wound upon the spindles, the blank spaces *z z′* of gear-wheels Z Z′ are brought opposite each other, thereby arresting momentarily the revolution of feeding-rollers Y Y′, while the rollers *w*, *w′*, and X are kept constantly in motion by the belt *k*, running from pulley K of shaft *d′*. The result of this stoppage of the feeding-rollers is to sever the web transversely, and thus separate the coil on the spindles from that portion of the web retained between the now stationary rollers Y Y′.

Immediately upon this severance of the web, cam *m′* again comes in contact with spur N, and separates the spindles R R′, as previously described, which separation liberates the coil from said spindles. The coil is now carried forward by apron W, and it may be removed therefrom by hand, or with any convenient appliances, after which the batting is wrapped in the usual manner.

As the feeding-rollers Y Y′ are stationary only while the teeth of wheels Z Z′ are not in gear with each other, the web is again set in motion soon enough to be grasped by the spindles R R′, when the latter are a second time advanced toward each other, after which advancement another coil of batting is wound upon said spindles, as previously described.

From the above description it will be seen that the successive operations of folding the opposite sides of the web, winding the threefold thicknesses of the same upon the spindles, severing the coil from the main body of the fabric, and then liberating the batting from the spindles are entirely automatic, and require no attention whatever from the attendant of the machine.

By simply interposing suitable gearing between the wheels *y* and Z the web may be severed at such intervals as to produce battings of any desired weight, and the width of fold may be regulated by properly adjusting the disks G G′. In Fig. 1 said disks are set for a narrow fold of the web, while in Fig. 3 they are set for a wider fold.

I have described my machine in its most complete form; but I reserve the right to modify the details of construction, provided the essential features are retained—as, for example, the web may be turned down from one side only, as seen in Fig. 8; or a single retracting-spindle may be employed, as seen at R″ in Fig. 9, which spindle may be fluted longitudinally, as represented in Diagram 10; or, if preferred, the end of the spindle or spindles may be scored radially, as seen in Diagram 11. Furthermore, the arm *o′* may be depressed with a spring or with a weight, as seen in Figs. 2, 3, and 5. Fixed plates may be substituted for the disks G G′; but the latter are preferred, because their rotation in the direction of progress reduces the friction incidental to the passage of the web through the machine. Finally, a series of rollers may be employed, instead of the fixed plates *c c′*.

I claim as my invention—

1. The combination, in a cotton-batting-folding machine, of an endless conveyer for advancing the web, and one or more twisted belts for turning the edge or edges of said web, substantially as herein described.

2. The combination, in a cotton-batting-folding machine, of an endless conveyer for advancing the web, one or more twisted belts for turning the edge or edges of said web, and one or more rotating disks for turning down and smoothing said edges, substantially as herein described.

3. The combination, in a cotton-batting-folding machine, of an endless conveyer, one or more edge-turning belts, one or more rotating disks, a pair of feeding-rollers, and mechanism for arresting the rotation of said rollers at suitable intervals for severance of the web, substantially as herein described.

4. The combination, in a cotton-batting-folding machine, of an endless conveyer, one or more edge-turning belts, one or more rotating disks, a pair of rollers for severing the web, one or more rotating spindles, and mechanism, substantially as specified, for causing said spindles to approach each other at suitable intervals and coil the web upon them, and then recede and liberate said coil, substantially as described.

5. In combination with a cotton-batting folder, one or more rotating spindles and mechanism, substantially as described, for advancing them at suitable intervals, and forming a coil of web, in the manner explained, and then retracting and liberating said coil, substantially as set forth.

6. The combination, in a cotton-batting folder, of common driving-drum B, twisted belts C C′, conveyer D *d*, rollers E H, and fixed guiding-plates *c c′*, substantially as described.

7. The combination, in a cotton-batting folder, of driving-drum B, twisted belts C C′, conveyer D *d*, rollers E H, gearing *e e′* F *f f′* *h h′* I *i i′*, and disks G G′, which disks are rotated by the friction-wheels *f′ i′*, or their equivalents, substantially as herein described.

8. In combination with the conveyer D *d* and twisted belts C C′ of a cotton-batting folder, the extended plate J, for maintaining the central or flat portion of the web smoothly upon said conveyer D, substantially as herein described.

9. In combination with the feeding-rollers Y

Y′ of a cotton-batting folder, the wheels *y*, Z, and Z′, which latter wheel, Z′, has a portion of its teeth removed at *z′*, to arrest the rotation of said feeding-rollers, and thereby sever the web at proper intervals, substantially as herein described.

10. In combination with rock-shaft O *o o′*, links *p p′*, vibrating rods P P′ *p″*, rotating spindles R R′, and mechanism, substantially as described, for rotating said spindles in a cotton-batting folder, the cam *m* and spur N, as and for the purpose stated.

11. The combination of vibrating rods P P′ *p″ p‴*, couplings Q *q* S *s′*, longitudinally-grooved spindles R *r* R′ *r′*, and pulleys T T′ *t t′*, which pulleys are driven by the loosely-applied belts 3 3′, substantially as herein described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

ROBERT CATLOW.

Witnesses:

JAMES H. LAYMAN,

D. P. KENNEDY.