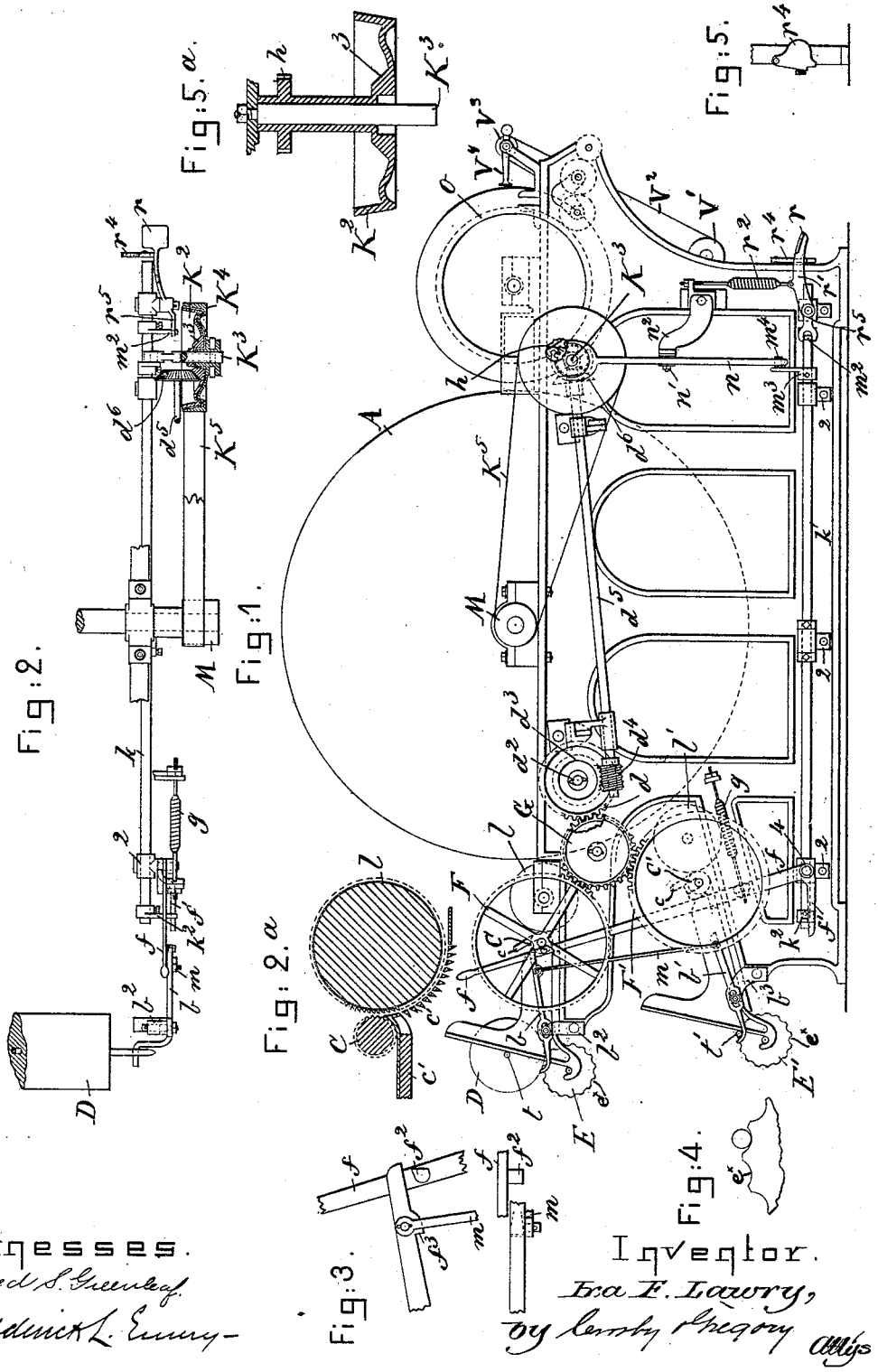
(No Model.) 2 Sheets—Sheet 1.

I. F. LAWRY.

CARDING MACHINE.

No. 457,354. Patented Aug. 11, 1891.



Witnesses.
Fred S. Greenleaf.
Frederick L. Emery.

Inventor.
Ira F. Lawry,
by Lemby Gregory Attys

(No Model.) 2 Sheets—Sheet 2.

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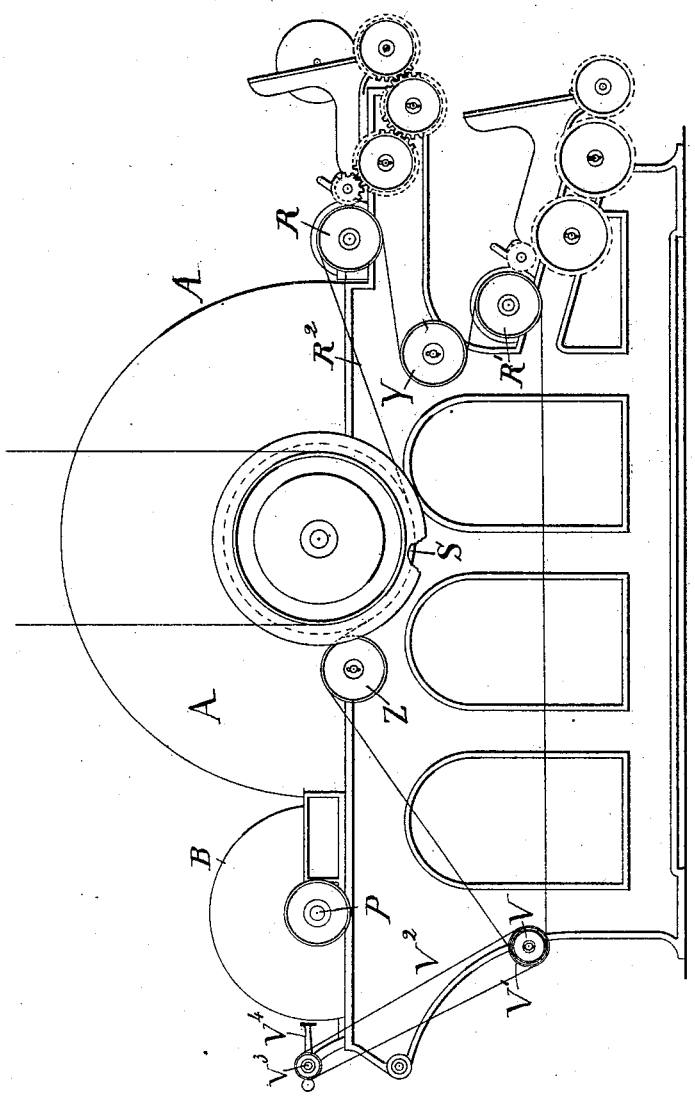

Fig: 6.

Witnesses
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UNITED STATES PATENT OFFICE.

IRA F. LAWRY, OF TAUNTON, MASSACHUSETTS.

CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,354, dated August 11, 1891.

Application filed November 24, 1890. Serial No. 372,458. (No model.)

To all whom it may concern:

Be it known that I, IRA F. LAWRY, of Taunton, county of Bristol, State of Massachusetts, have invented an Improvement in Carding-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in carding-machines has for its object to provide the same with stop-motion mechanism, whereby the doffing and feeding mechanism may be automatically stopped whenever the lap runs out. With stopping mechanism for the doffer and feeding mechanism and main cylinder I have also combined two sets of feeding mechanism whereby two laps may be simultaneously fed to the main cylinder at different points, to thereby better and more evenly supply the main cylinder with fibrous material to be carded, such feeding not only resulting in increasing the product of the card, but also improving the quality of the carded material, and this is accompanied with less wear on the delicate card-teeth. This provision for stopping the action of the feeding mechanism and of the doffer is of especial importance when two—or it may be more—laps are being fed to one and the same cylinder, for unless the said parts be stopped as soon as one bat runs out or fails to be correctly supplied the film taken off the cylinder by the doffer would vary in weight and thickness, thus making it impossible to produce uniform yarn.

My invention, therefore, broadly comprehends and includes the combination, with a card-cylinder, feeding mechanism therefor, and a doffer and its actuating mechanism, of stop-motion devices intermediate the said feeding mechanism and the said doffer-actuating mechanism, including a releasing-lever to be struck by the lap-rod, when it descends into its lowest position, by reason of absence of lap therefrom, whereby, on the running out of the lap, the feeding mechanism and the doffer are automatically stopped.

Other features of my invention will be hereinafter described and pointed out.

Figure 1 in side elevation represents a carding-machine embodying my invention, the top-flats not being shown, as they may be of any usual construction and be manipulated in any usual way, part of the toothed gear F and part of the frame-work being broken out to show parts behind them. Fig. 2 is a partial plan and sectional view in detail, chiefly to show the stop-motion devices intermediate the feeding mechanism and the doffer-actuating mechanism, part of the friction-pulley hub shown separately in Fig. 5^a being broken out to show parts below it; Fig. 2^a, a detail of the feeding mechanism, but enlarged. Figs. 3, 4, and 5 are details to be referred to; Fig. 5^a, a detail showing one of the friction-pulleys, and Fig. 6 is an elevation of the opposite side of the machine from that shown in Fig. 1.

I have omitted the teeth from the different cylinders to simplify the drawings.

Referring to the drawings, A represents a carding-cylinder, and B a doffer of usual construction.

As herein represented, the feeding mechanism consists of a feed-roll C, the journals of which are mounted in suitable bearings *c*, the said feed-roll acting upon a single thickness of the lap lying upon a "shell" or "plate" *c'*, as it is called, of usual construction. The lap D, wound upon any metal lap-rod *t*, rests upon a lap-roll E of usual construction, except that the longitudinal grooves $e^{\times}$ therein are made deeper than heretofore, in order that the said lap-rod may enter one of the said grooves when the lap runs out or becomes exhausted, and in doing so set into operation the stop-motion to be described.

Co-operating with the feed-roll C and located between it and the main cylinder is a licker-in *l* of usual construction, it having upon one end (see Fig. 6) a pulley R.

As herein represented, the feed-roll C has fast upon one end of it a toothed gear F, which is engaged by an intermediate gear G, in turn engaged by a gear *d*, mounted upon a stud d^2, secured to the frame-work, the said gear having attached to it a worm-toothed gear d^3, which is engaged by a worm d^4 upon a rotating shaft d^5, having at its opposite end a beveled gear d^6, which is engaged by a beveled gear 3 at the interior of the part K^2 of a friction-pulley mounted upon a stud K^3 projected from one side of the frame-work. Co-

operating with this friction-pulley K^2 is a pulley part K^4, which receives about it the belt K^5, extended around a pulley M, fast on one end of the cylinder-shaft, so that the said cylinder when rotated in usual manner will, through the belt K^5, rotate the pulley part K^4, and when the part K^4 is in contact with the part K^2 will rotate the feed-roll to feed the lap to the licker-in, the latter taking the lap from the feed-roll and giving it up to the carding-cylinder in usual manner.

Instead of the particular pulley K^2, I may employ any other usual or suitable friction-pulley or toothed clutch-pulley, and instead of the worm-gear and worm-pinion I may use any other usual gearing. The intermediate gear G referred to engages a toothed gear F′, fast on the shaft of the second feed-roll C′, it having co-operating with it a licker-in l', the feed-roll C′ acting upon the material delivered from a lap wound upon a rod t', the lap resting upon a lap-roll E′.

From the foregoing description it will be readily understood that the two sets of feeding mechanism may be actuated in unison, and instead of the particular feeding mechanism, each set of which is shown as containing a roll and a plate, I may employ any other usual or suitable feeding mechanism commonly employed in connection with carding-machines.

The pulleys R and R′ on the shafts, respectively, of the licker-in rolls l and l' are driven by a belt R^2, which is actuated by a pulley S, fast upon the main cylinder-shaft, the said belt passing over idler-pulleys Y and Z, and also over a pulley V, mounted upon a suitable stud of the frame-work, the pulley V having alongside of it a pulley V′, which drives the belt V^2, extended over the usual shaft V^3, for actuating the comb V^4, which takes the film from the doffer B, the said comb in practice being of any usual construction. The shaft P of the doffer B has suitable bearings in the frame-work, and said shaft is provided with a gear O, which is engaged by a pinion h, connected to and so as to be rotated with the part K^2 of the driving-pulley.

Co-operating with the feeding mechanism containing the roll C is a lever b, and co-operating with the feeding mechanism containing the roll C′ is a lever b', each of the said levers being suitably pivoted upon stands b^2 b^3. The inner ends of these levers b b' are jointed together by a rod m, so that when one or the other lap-rod comes upon one or the other of the said levers both of them will be moved to start the operation of the stopping mechanism, to be described, of which stopping mechanism they both form a part when two sets of feeding mechanism are used.

Upon the frame-side are suitable bearings 2, which receive a rock-shaft k, having at one end a collar provided with a lug or projection k^2, the said rock-shaft at its other end having a collar provided with a lug or projection m^2 and near its end having also connected to it a collar m^3, having a pin m^4, which engages the lower end of a lever n, pivoted at n' upon a stand n^2. The upper end of the lever n has ears to enter an annular groove in the hub of the pulley part K^4. One of the stands 2—namely, that one at the left in Fig. 1—has a stud 4, which constitutes the fulcrum for the shipper-lever f, having an arm f', which is extended so as to come within the range of movement of the projection k^2. The shipper-lever f has a projection f^2, which is engaged by a catch or projection f^3, forming part of the lever b, the said catch engaging the said projection when the machine is running and the laps are being properly fed to the main cylinder; but as soon as a lap-rod strikes the outer or short arm of either lever b b' the lever b is lifted to remove its catch from the projection f^2, letting the spring g, connected to the shipper-lever f, move the said lever into the position shown in Fig. 1, which will move the shipper-lever so that its arm f', acting on the projection k^2, will turn the rock-shaft k and the lever n and cause the latter to disengage the pulley parts so that the part K^2 is left at rest, and consequently the feeding mechanism and the doffer-actuating mechanism and doffer are immediately arrested in their motion.

If it is desired to start the machine from the doffer end thereof, the operator will push back the catch r^4, pivoted upon a part of the frame-work, and disengage it from the lever r, acted upon by the spring r^2, causing said spring to turn the rock-shaft r', having a projecting forked arm r^5, which engages the projection m^2, the projection k^2 at such time acting on the arm f' on the shipper-lever, throwing its upper end over to the left, viewing Fig. 1, putting its projection f^2 in position to engage the latch f^2 of the lever f.

Instead of the particular intermediate devices between the doffer-actuating gear and the feeding mechanism, I may use any other usual or equivalent means to stop the rotation of the said gear coincident with the stopping of the feeding mechanism.

I claim—

1. In a carding-machine, the following instrumentalities, viz: a card-cylinder, feeding mechanism therefor, a doffer, and their actuating mechanism, stop-motion devices intermediate the said feeding mechanism and the said doffer-actuating mechanism, including a releasing-lever to be struck by the lap-rod when it descends into its lowest position by reason of absence of lap therefrom, whereby on the running out of the lap the feeding mechanism and the doffer are automatically stopped, substantially as described.

2. In a carding-machine, the following instrumentalities, viz: a card-cylinder, two sets of feeding mechanism therefor, a doffer, and their actuating mechanism, stop-motion devices intermediate the said feeding mechanisms and the said doffer-actuating mechanism, including releasing-levers to be struck

by one or other lap-rod when it descends into its lowest position by reason of absence of lap therefrom, and connections between said levers, whereby on the running out of a lap the feeding mechanisms and the doffer are automatically stopped, substantially as described.

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

IRA F. LAWRY.

Witnesses:
CHAS. L. HANDFORD,
JOHN T. MEATZ.