2 Sheets. Sheet 1.

A. D. Shattuck,
Carding Machine.

No. 15,781. Patented Sept. 23, 1856.

Fig: 3.

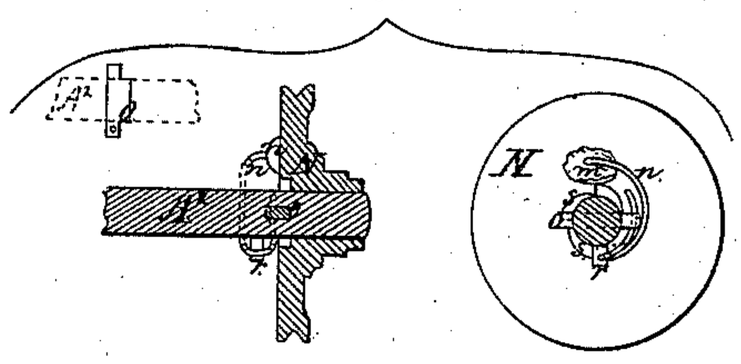
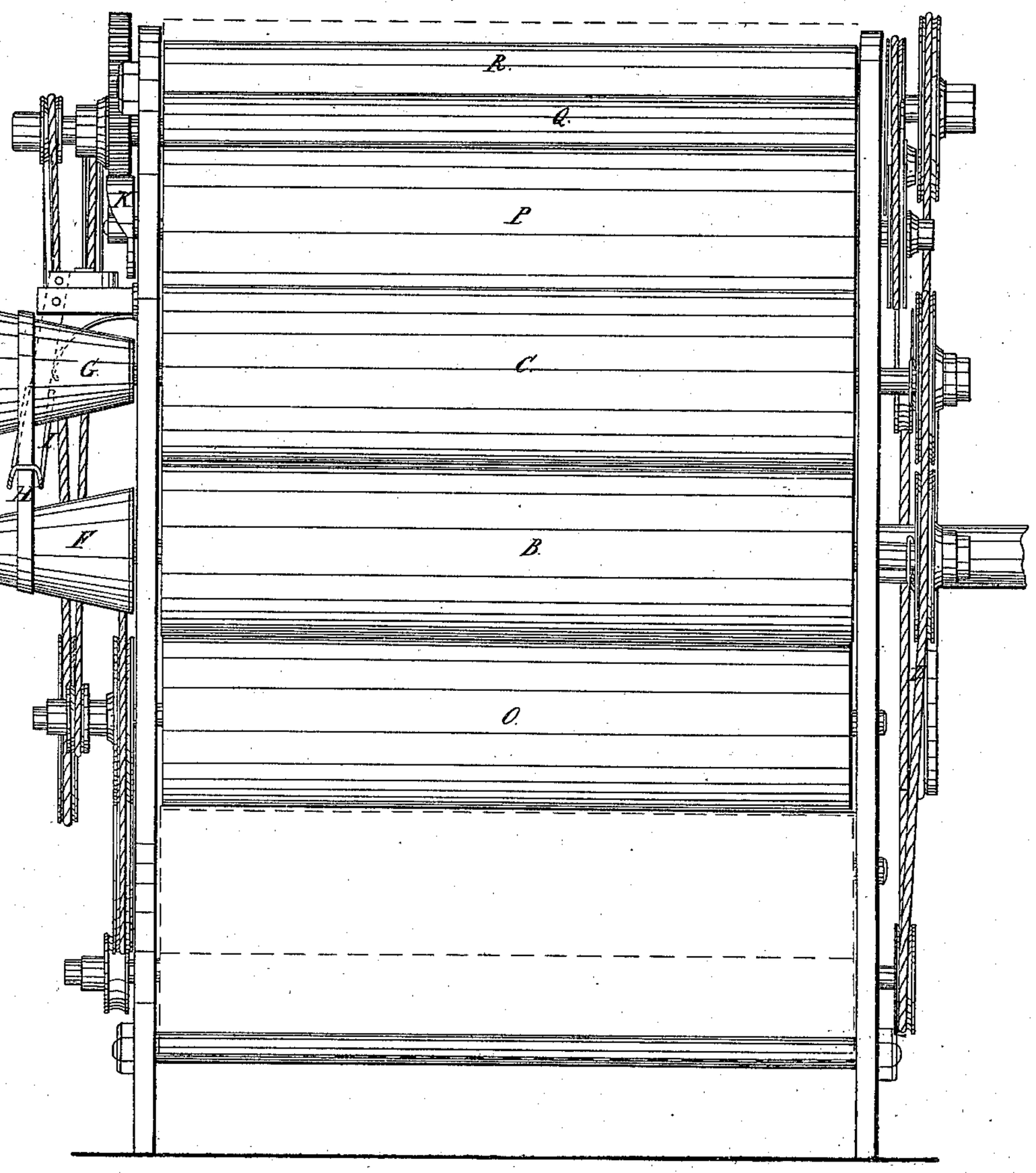


Fig: 1



2 Sheets. Sheet 2.

A. D. Shattuck,
Carding Machine

No. 15,781. Patented Sept. 23, 1856.

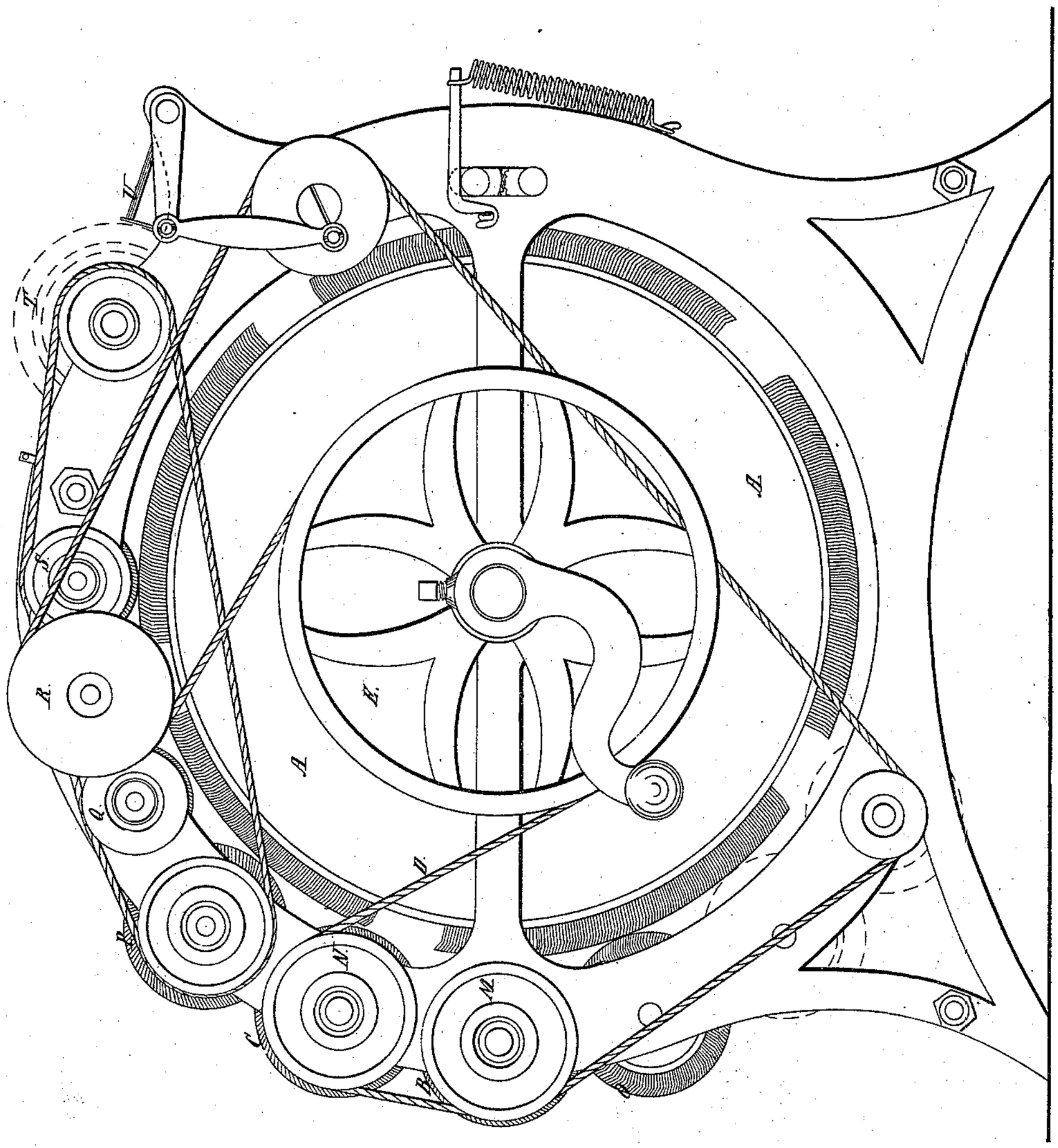


Fig: 2.

UNITED STATES PATENT OFFICE.

A. D. SHATTUCK, OF GRAFTON, MASSACHUSETTS.

IMPROVEMENT IN CARDING-ENGINES.

Specification forming part of Letters Patent No. **15,781**, dated September 23, 1856.

To all whom it may concern:

Be it known that I, A. D. SHATTUCK, of Grafton, in the county of Worcester and State of Massachusetts, have invented a new Compound or Double Carding-Engine, the cylinders of which mutually and constantly strip and clean each other; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a front view; Fig. 2, an end view; Fig. 3, details, which will be referred to hereinefter.

In carding-engines as ordinarily constructed and operated the main cylinder is cleared or stripped by hand at intervals, the card being stopped at the time for the purpose. Upon every such occasion and after each stripping the operation of the card is modified and a variation in the lap is the consequence. This variation or unevenness of the lap runs through the whole subsequent preparation of the cotton, and is even felt to a certain extent in the thread which is ultimately produced.

Efforts have been made to do away with the necessity of hand-stripping and to avoid the objections to which this method is liable by the employment of a stripper-cylinder, which alternately runs faster and slower than the main cylinder, so that the stripper alternately strips the main cylinder, and in turn is stripped thereby as the relative velocities of the two change. It is evident, however, that a card thus constructed and operated cannot produce an even and uniform lap, as at one time the stripper is taking cotton off the main cylinder and at another is returning it thereto. To accomplish this end without the above-named objections is the object of my present invention, which consists in the use of two strippers to the main cylinder in connection with a doffer which returns the cotton instantly to the main cylinder as fast as it is taken off by the strippers, whereby an uninterrupted and continuous action is preserved not productive of the unevenness of lap before mentioned. The strippers are caused to run with a variable speed, each alternately faster and slower than the other and at a velocity alternately above and below that of the main cylinder, and thus one or other of them is constantly stripping the main cylinder, while the cotton taken off is instantly returned to the main cylinder either by the doffer or by one of the strippers which at the time may be running slower than the cylinder and acting as a doffer to the other strippers.

To enable others skilled in the art to understand my invention, I will proceed to describe the manner in which I have carried it out, premising with a few definitions necessary to a proper understanding of the subject.

The small cylinders of carding-engines, which operate in conjunction with the main cylinder, are called "workers," "doffers," or "strippers," according to the nature of their operation with respect to each other or upon the main cylinder. Workers and doffers receive and strippers take the cotton from the cylinders.

A worker, first, runs slower than its cylinder; second, its teeth are set against the cylinder-teeth; third, it is cleaned of its cotton by a stripper, from which the cotton is taken again by the cylinder.

A doffer, first, runs slower than its cylinder; second, its teeth are set against the cylinder-teeth; third, it is cleaned of its cotton by a comb or by a stripper.

A stripper, first, runs faster than its cylinder; second, its teeth are set with the cylinder-teeth; third, it may be cleaned of its cotton by another stripper or by a doffer or by a cylinder.

In the accompanying drawings, A is the main cylinder; B and C, two small cylinders, which are driven with a surface velocity somewhat less than that of the main cylinder by the band D from a pulley E upon the shaft of the main cylinder. Upon the opposite end of the machine these cylinders carry the cones F and G, the band H, which actuates them, being regularly traversed from one end of the cones to the other by the guide I, which is moved regularly back and forth by a cam K upon the shaft of one of the small cylinders, or in any other customary and suitable manner. The peculiar method by which this is effected forms no part of my present invention and need not be further described.

It is evident that as the band H is shifted upon the cones one or other of the cylinders B and C will run faster than is due to the motion of the driving-band D, and that some

device is necessary to enable the cylinders to run independent of their pulleys M and N whenever their motion is accelerated. This is effected in the following manner: The pulleys M and N are connected with the shafts of the cylinders by means of clutches so arranged that whenever the cylinders are driven by their pulleys M and N these pulleys are clutched with the shafts; but whenever the cylinders run faster than is due to the motion of the band D their shafts revolve freely within the pulleys. The device which I have chosen for this purpose is represented in Fig. 3, in which N is the pulley, A^2 the shaft of the stripping-cylinder, *m* a pad or block which is secured to the shaft A^2 by the bent spring *n*, which passes through a bolt or catch *o*. The spring *n* revolves freely in the block *r*, projecting from the shaft. When the pulley revolves faster than the shaft, its friction upon the pad draws the bolt *o* through the shaft and into one of the notches *s* in the wheel, and thus the latter communicates its motion to the shaft. When, however, the latter revolves faster than it is driven by the wheel, the pad *m* is driven in the opposite direction, the bolt *o* is unlocked from the wheel, and the shaft revolves independently of the wheel.

The cylinder O is a worker. It runs uniformly with a velocity one-eighth that of the main cylinder, and is stripped by the cylinder B.

The cylinder P is a doffer to the variable cylinder C. It runs uniformly and returns the cotton taken from this cylinder onto the main cylinder.

Q and S are workers which operate in the ordinary way upon the main cylinder.

R is a stripper to both the cylinders Q and S, by which arrangement of one stripper between the two workers the space occupied by one stripper is saved.

T is the main doffer, from which the cotton is taken in the ordinary way by the comb U.

I will now describe more particularly the operation of that portion of the mechanism which forms the subject of my present invention.

The cylinders B and C can never revolve with a velocity less than that due to the motion of the band D. Either of them may, however, revolve with a greater velocity, as before explained. Suppose the band H to be upon the large end of the cone G and the smaller end of the cone F. The cylinder C will then run with its minimum velocity, being driven by the band D, and the cylinder B will be driven at a more rapid rate by the band H, the shaft of this latter roll revolving freely in the pulley, which is still driven at a uniform rate by the band D, as before explained. The cylinder B now strips the main cylinder, taking off all (or very nearly all) the cotton from its surface, and at the same time stripping the working-cylinder O. The cotton thus taken off by the cylinder B is carded onto the cylinder C, which now acts as a doffer to B, and as C now runs slower than the main cylinder it is stripped by the latter, and thus the main cylinder, the worker O, and the cylinder C are stripped. As the band H is traversed back toward the machine the velocity of the cylinder B diminishes and that of the cylinder C increases, and when the band has arrived at the small end of the cone G the cylinder B travels with its minimum and C with its maximum velocity. The cylinder B is now stripped by the main cylinder, though it continues to act as a stripper to the worker O. The main cylinder is now stripped by the cylinder C, which is doffed by the cylinder P, which in its turn is stripped by the main cylinder. Thus by the use of the two variable cylinders B and C running alternately above and below the velocity of the main cylinder and in connection with the doffer P all these cylinders as well as the worker O are stripped and cleaned at short intervals of time without occasioning any break or unevenness in the lap and without the necessity of stopping the engine for the purpose. It will be seen that this stripping process is also a carding process. In all other methods of carding heretofore used the stripping process is an interruption of the carding process. By the application of other variable cylinders in addition to those herein described, the carding ability of the machine may be proportionally increased.

What I claim as my invention, and desire to secure by Letters Patent, is—

The application to the main cylinders of carding-engines of two or more variable cylinders, in combination with a doffer operating in the manner and for the purpose substantially as herein set forth.

A. D. SHATTUCK.

Witnesses:

J. W. SMITH,

ALFRED DUNHAM.