

J. Dyson. Carding Engine.

N^o 39,902.

Patented Sept. 15, 1863.

Fig. 2.

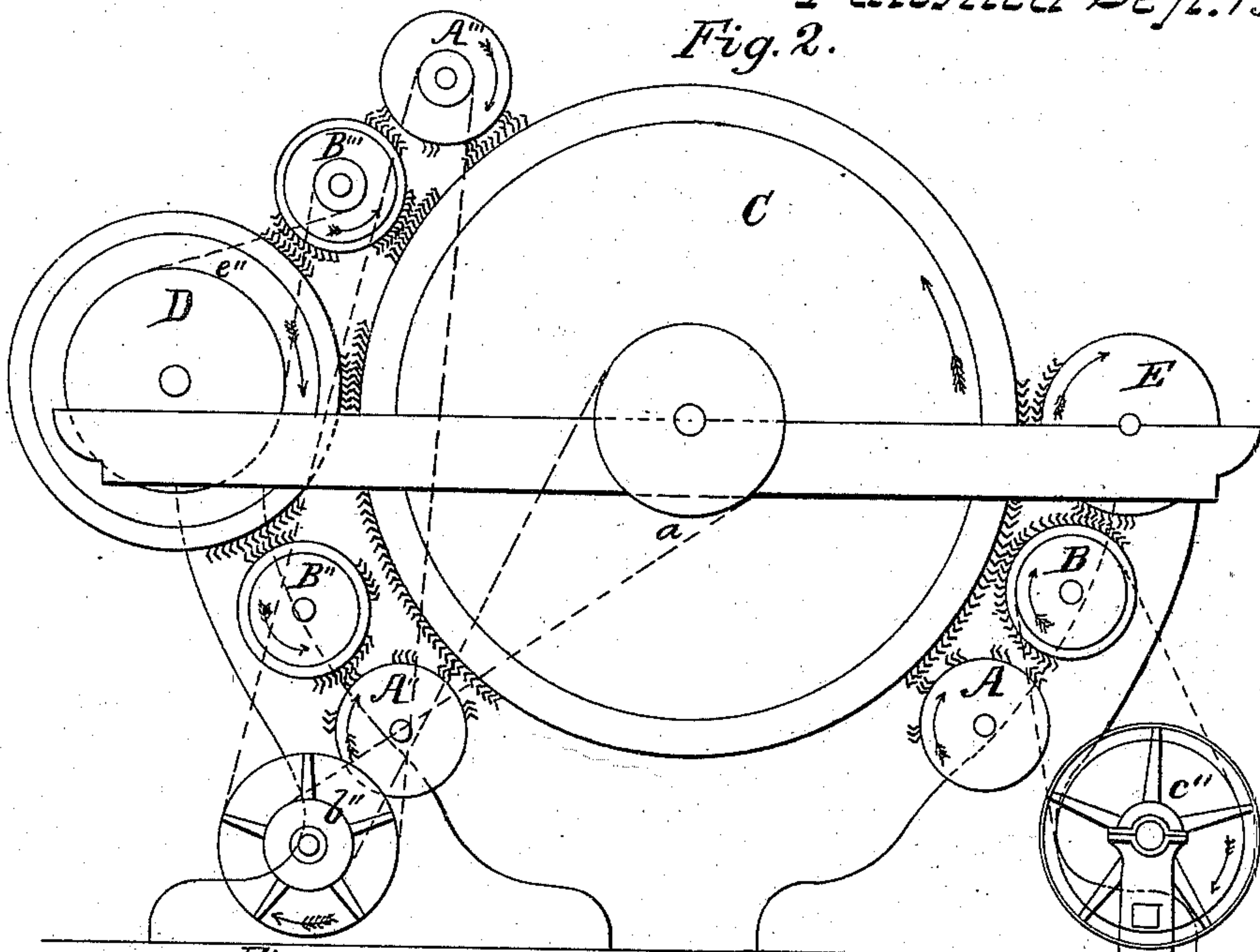


Fig. 3.

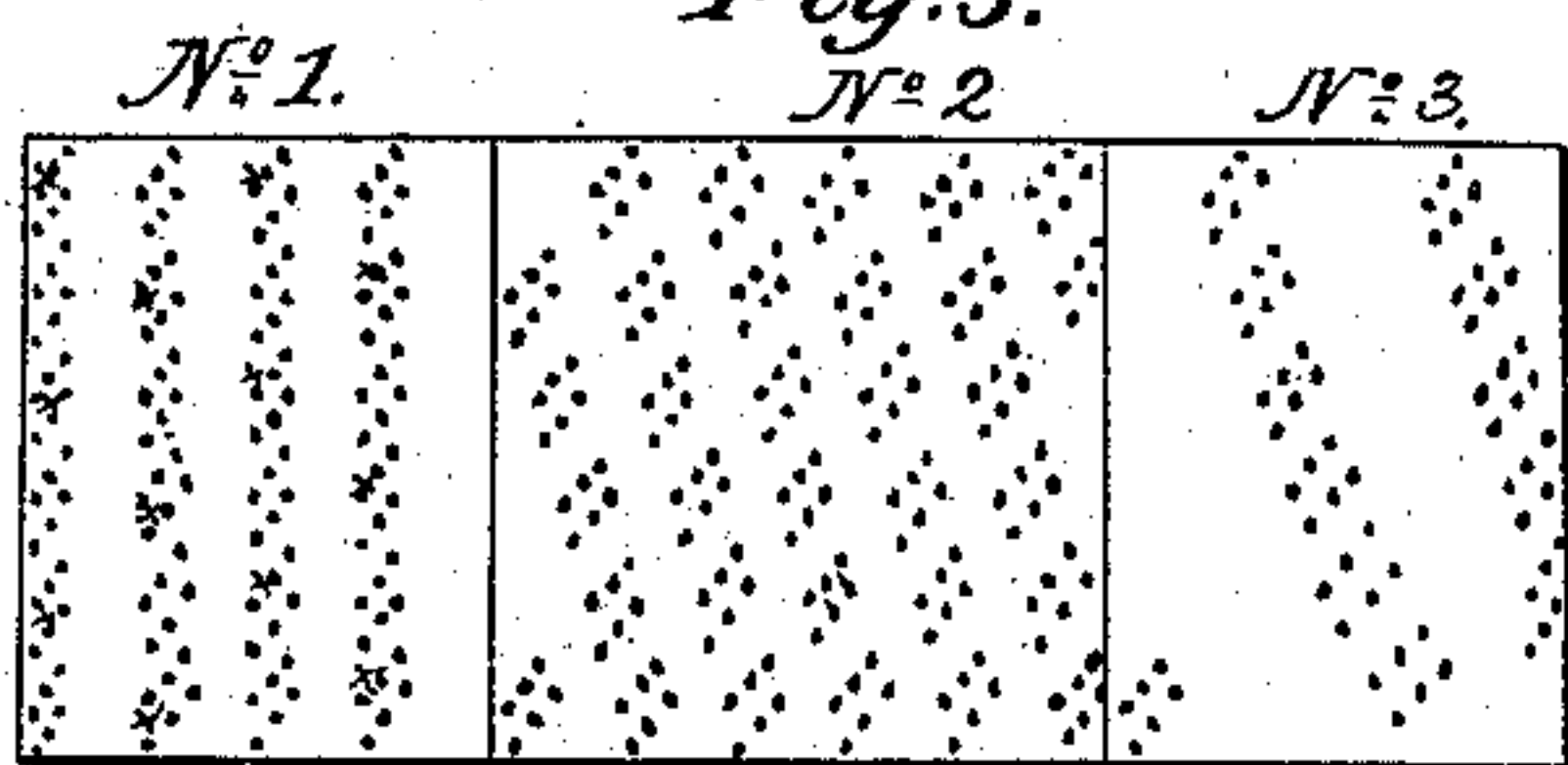


Fig. 4.

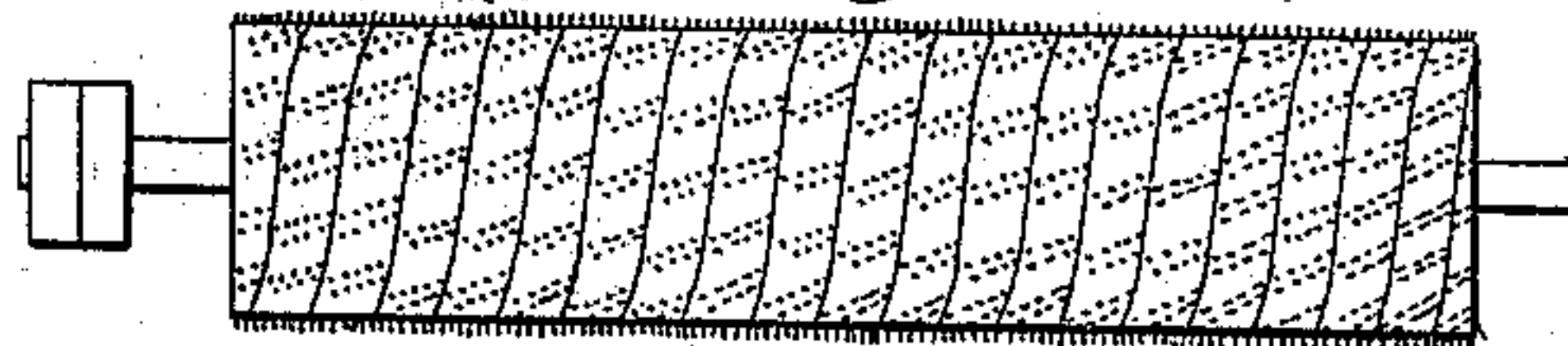
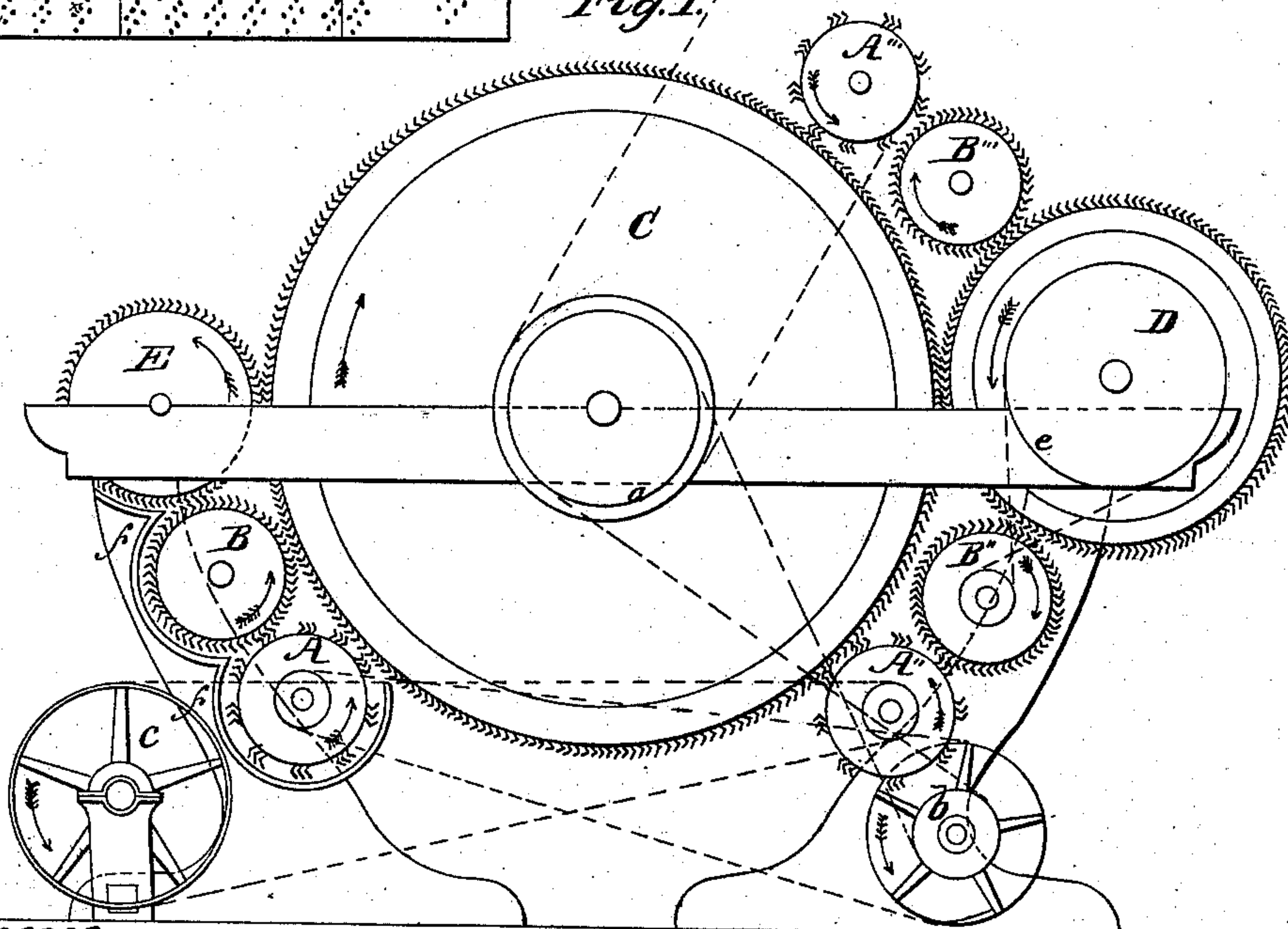


Fig. 1.



Witnesses.

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JEPHTHA DYSON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CARDING-ENGINES.

Specification forming part of Letters Patent No. **39,902**, dated September 15, 1863; antedated February 21, 1863.

To all whom it may concern:

Be it known that I, JEPHTHA DYSON, late of South Carolina, and now residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in carding-engines, for stripping the main cylinders of the same while running, and for returning the strippings to the main cylinders or transferring the same to the doffers or other cylinders, the method herein described being intended as an improvement on the plan of stripping the main cylinders of carding-engines secured to me by Letters Patent bearing date the 20th of February, 1849.

To enable others skilled in the art to which it relates to make and use my invention, I hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a longitudinal and vertical section of the card-frame, and in which is also represented an end view of the main cylinder C, the doffer D, and the licker-in E, while A A' A'' represent an end view of the stripper, and B B' B'' an end view of the receiver, located and arranged in three several positions, according as it may be desired to return the strippings to the main cylinder or to transfer the same to the doffer, either on the lower or upper portion of its periphery. Fig. 2 represents a longitudinal and vertical section of the same on the opposite side, with additional pulleys for operating a portion of the cylinders. Fig. 3 represents a plan for preparing the card-fillet for clothing the stripper, showing the peculiar method of inserting and arranging the teeth in the fillet. Fig. 4 gives a view of the stripper-cylinder and the manner in which it is clothed with card-fillet. Fig. 5 represents card-teeth—No. 1 in the usual form, No. 2 in the form designed for the stripper.

The result aimed at and sought to be accomplished by the method or improvement herein described is to transfer all the carded material in the character of strippings, either of cotton, wool, or mixture thereof, from the stripper or clearing cylinder to the receiver or doffing cylinder, operating point to point, as in the operation of carding, without the ne-

cessity of clearing the stripper at intervals by hand or by aid of a cylinder operating from heel to point, with a greater surface speed, at necessary intervals of time.

It is well known to those versed in the business of carding that a card cylinder charged with the material to be carded, and operating on another point to point as a worker in the operation of carding, transfers only a portion of the carded material to the latter, and that as the card-cylinders have been hitherto constructed and clothed it is only by the use of a hand-card or cylinder-card operating from heel to point that either can be cleared or stripped. Thus the main cylinder receives at the feed-rollers and licker-in the whole amount of the material to be carded, and carrying it over in contact with the carding-surfaces in the form of top-flat cards or working-cylinders, as the case may be, and, after passing the same, transfers a certain portion of the carded material to the doffer-cylinder; but, owing to the great surface of the main cylinder at a high velocity and the centrifugal force imparted to the carded material giving it constant tendency to fly off, it is enabled to transfer much the largest portion of the carded material to the doffer-cylinder, while the latter, from its slow surface motion, enables the card-comb operating from heel to point to take off a continuous fleece, called a "sliver;" but notwithstanding this constant tendency to the surface from the cause described, the card-sheets of the main cylinder become filled and clogged, and it becomes necessary every two or three hours in cotton-carding to stop and clear the cylinders by hand until within the last ten or twelve years, where self-stripping cylinders have been coming into use. To clear these self-stripping cylinders, when they in their turn become filled, the plan of reducing the surface velocity of the stripper at intervals below that of the main cylinder has been employed, by which the latter in turn became the clearer of the former.

Now, the object of the present improvement is to construct or clothe the stripper in such manner and form as shall cause it, while running at the uniform velocity required, both to strip the main cylinder, and at the same time transfer all the strippings to a receiver or doffing cylinder without the teeth of the

said stripper becoming filled or clogged with the carded material and without the necessity of reducing or varying the surface velocity, whereby greater uniformity in the delivery at the doffer is secured, the operation of the carding-engine and the stripping process materially simplified and reduced in cost.

The cylinder of the stripper A is constructed in the usual form of small card cylinders of the same length as the main cylinder and from about five to seven inches in diameter, with suitable sized journals of the usual form, and having a fast and loose pulley attached to one end for driving and for stopping the same. This cylinder is clothed with card-fillet about one and a half inch in width, with card-teeth of iron or steel wire in the usual form, except that they are made with a more obtuse angle and so far varied from the usual form as to bring the external portion of the teeth nearer in the direction of radii from the center of the stripper-cylinder, as shown in Fig. 5, No. 2, for the purpose of facilitating the transfer of the strippings to the receiver or doffer cylinder. To effect still further this purpose and to increase the effect of the centrifugal force in throwing off the strippings to the receiver, I insert into the fillet only from about one-third to one-sixth of the quantity or number of teeth usually employed in fillet of the same number of wire, and set them in groups, substantially in the manner shown in Fig. 3, Nos. 1, 2, or 3, with open spaces between the groups of teeth of from one-fourth to three-eighths of an inch or more apart, in order to lessen the adhesion of the strippings between the teeth when there is a tendency in them to settle down and pack between the same. To lessen still further, if necessary, this tendency of the strippings to adhere between the teeth, alternate groups of No. 1 (marked with an X in red ink) may be extracted without impairing in any perceptible degree the success of the stripping process, at the same time lessening the current of air, if found greater than desirable. The spaces, as exhibited in No. 3, may be assumed as the extreme limit to which it is advisable to extend the spaces.

Without limiting the method used to precise modes and forms, the principles above described in setting and adjusting the teeth of the stripper are always to be kept in view.

The method above described of transferring the strippings from the stripper to the receiver results from simple mechanical forces readily comprehended, and may be thus explained: The form and direction given to the external part of the teeth of the stripper being nearly in the direction of radii to the center gives to the teeth of the receiver, from their greater inclination and oblique action, superior facility in laying hold of the fibrous material, and increased power of drawing it from the teeth of the stripper, while the less oblique or less inclined direction of the teeth of the latter offers greater resistance to the fibers of the

strippings being driven down in the direction of the center of the cylinder. In the next place, the form and direction of the teeth of the stripper greatly increases the tendency of the centrifugal force of the stripper, from its great surface velocity, to throw off from its surface, as it passes the stripping-point in the direction of a tangent, the strippings directly on the face of the receiver. A large portion of the strippings are thus actually thrown off, as may be seen in the operation, while the portion still retained on the surface of the stripper is taken off by the cylinder B at the point of contact with the stripper A. The card-fillet for the stripper, being prepared as above described, is wound spirally round the cylinder from end to end, so as to cover the entire surface of the same in the usual manner, and firmly fastened.

The cylinder for the receiver B is constructed in the same manner and form as the stripper-cylinder, and of like dimensions. It may be clothed with one-and-a-half-inch card-fillet, in all respects the same as small card-cylinders are usually clothed. The stripper A and receiver B thus prepared are mounted in suitable and adjustable bearings, at any convenient point between the lick-in and doffer, below the main cylinder C, as shown in Fig. 1, and their surfaces and that of the main cylinder adjusted as near to each other as may be without touching, the teeth of each cylinder pointing in the direction as indicated by the arrows in Fig. 1. The stripper A may be driven from a narrow pulley, *a*, fitted on the shaft of the main cylinder C, by a belt leading therefrom to the smaller part of the double or speed pulley *b*, attached to the lower part of the card-frame, with another belt leading from the larger part of the double pulley aforesaid to the fast pulley on the stripper-shaft, as shown in Fig. 1; or the strippers of a whole line of cards may be driven from pulleys, as at *c*, Fig. 1, on a line of shafting driven from the main line of shafting in the card-room and extending along either end of the entire row of carding-engines; but in whatever way driven the speed must be so adjusted that the surface velocity of the stripper shall exceed that of the main cylinder about one-fourth, and driven as indicated by the arrow at Fig. 1. The receiver B may be driven by a pulley fitted on the opposite end of the shaft of the main cylinder at *d*, Fig. 2, and of the same size as *a*, or from some other shaft of the card; or it may be driven from a pulley, *c''*, Fig. 2, on the line of shafting above described for driving the strippers. It should be driven with a surface velocity not exceeding two-thirds of that of the main cylinder, and in the direction shown by the arrow at B.

When the strippings from the main cylinder are to be delivered to the doffer D, instead of being returned to the main cylinder, the stripper A'' and the receiver B'' are placed below the main cylinder and under the doffer D, as shown in the second position in Fig. 1, and

their position reversed. In this new combination the stripper A'' still operates in combination with the main cylinder C , and with the receiver B'' , as in the combination already described; but, instead of B'' operating in combination with the main cylinder C , it is made to operate in combination with the doffer D and to deliver the strippings received from the stripper A'' to the doffer D . To effect this purpose the respective cylinders A'' , B'' , and D in this combination are adjusted as near to the surface of each other as may be not to touch, as in the combination already described, and driven in substantially the same manner, the stripper A'' with the same surface velocity as in the other combination, while that of B'' is somewhat modified, so that its surface velocity shall be double or more than that of the doffer D , and may be driven from the pulley e on the end of the doffer, as shown in Fig. 1, causing a cylinder running with a slow surface velocity to become the clearer of one running with double its surface velocity, and yet operating from heel to point. By this arrangement all the carded material not taken directly from the main cylinder by the doffer D is by this indirect method transferred to it, carried up to the card-comb and delivered at once into the sliver, the unnecessary and injurious action of repeated cardings of the strippings avoided, and the production of the carding-engine materially augmented. All the cylinders in this combination are made to revolve in the direction represented by the arrow in Fig. 1. The production of the carding-engine may be still further increased and additional carding-surface obtained by a third combination, as shown in Fig. 1, in which the stripper A''' and receiver B''' are mounted and arranged above the doffer D in the same manner in all respects as the last combination described, except in position, and the two cylinders A''' and B''' are driven with the same velocity and in the same direction relatively to the main cylinder and doffer D , as shown by the arrows at A''' and B''' , Figs. 1 and 2; but as the carded material delivered by B''' to the doffer D would again have to pass the teeth of the main cylinder, which would carry off a portion of it before taken from the doffer by the card comb,

there would still be a necessity, in order to keep the main cylinder clear below, for the employment of a stripper and receiver under the doffer D , as in the second combination, or at some convenient point between the doffer D and the licker-in. The stripper A''' may be driven from the pulley d on the opposite end of the main-cylinder shaft and the double pulley b'' , as shown in Fig. 2, or from a line of shafting extending along either end of an entire row of cards, as described in the first combination, and the receiver B''' from a pulley, e'' , on the opposite end of the shaft of the doffer D , Fig. 2, or some other shaft of the card, or from a line of shafting, as described in the first combination. A semicircular concave covering of metal or wood is fitted in close proximity to the outer surface of the stripper and receiver wherever located, as shown at f , Fig. 1, to secure the flyings, and when below the main cylinder, made with suitable apertures to permit the escape of sand, motes, and other impurities.

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

1. The stripper A , constructed and clothed as described, having card-teeth formed or constructed and inserted into the fillet in the peculiar manner set forth and described.
2. The stripper A , with clothing prepared and applied in the manner and form as described, in combination with the cylinder B and with the main cylinder C , and operated below the said main cylinder C at any convenient point between the doffer D and the licker-in E , substantially as described, and for the purposes set forth.
3. The stripper A'' , as described, in combination with the main cylinder C , the cylinder B'' , and the doffer D , operated below the main cylinder C and doffer D , substantially as described, and for the purposes set forth.
4. The combination and arrangement of the stripper A''' with the features described in the third claim, and operated above the doffer D and the main cylinder C , substantially as described, and for the purposes set forth.

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Witnesses:

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