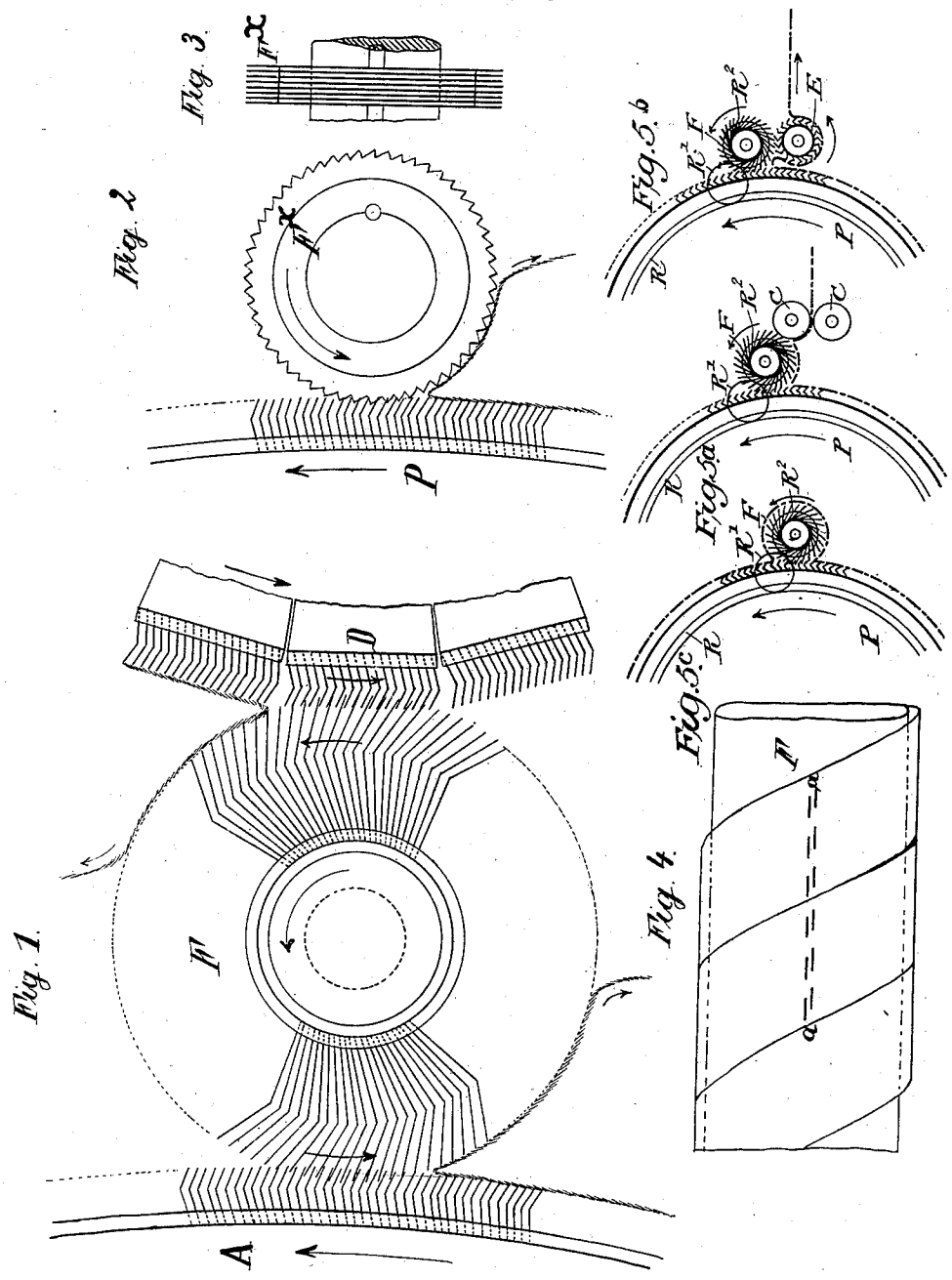
No. 656,402. E. GESSNER, Dec'd. Patented Aug. 21, 1900.

D. GESSNER, Administrator.

CARDING ENGINE.

(Application filed Mar. 26, 1895.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

ERNST GESSNER, OF AUE, GERMANY; DAVID GESSNER ADMINISTRATOR OF SAID ERNST GESSNER, DECEASED.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 656,402, dated August 21, 1900.

Application filed March 26, 1895. Serial No. 543,205. (No model.)

To all whom it may concern:

Be it known that I, ERNST GESSNER, machine-builder, of Aue, in the Kingdom of Saxony, Germany, have invented new and useful Improvements in Carding-Engines, of which the following is a full, clear, and exact description.

In the operation of a carding-engine as at present constructed the material is worked, by means of the drum, on card-clothed doffing and working rollers or revolving flat cards, all these running in the same direction as but at a lower speed than the drum itself. These doffing and working rollers or revolving flat cards are furnished with a card-clothed surface having teeth which are rearwardly directed with regard to their direction of motion, said teeth taking up a portion of the fleece from the drum or swift, which fleece is removed and in turn is taken off of the doffer by a comb and from the workers or flat cards by means of strippers; but in this method of removing the fleece there is a drawback in that the card-clothed surface of the doffers and workers or flat cards always retain certain portions of fleece and also impurities, which gradually increase and clog the teeth of the card-clothing, so that a periodical cleaning of the card-clothing is necessary. This periodical cleaning of the card-clothing is detrimental and involves a loss of time by interrupting the working of the machine. Moreover, it is not possible to obtain uniformity of working of the card, because the efficiency of the card varies according to the state of the clothing when it has just been cleaned or as it becomes clogged.

Now the object of the present invention is to obviate these drawbacks and to remove the material from the workers, doffers, flat cards, or any working parts of the carding-engine having their teeth rearwardly directed with regard to their direction of motion in such a manner that no portions of the fiber or impurities shall be retained on or between the teeth. This is accomplished by applying to the working parts a comb-roller having its teeth rearwardly directed with regard to their direction of motion and moving in direction opposite to the adjacent teeth of the coöperating working parts, thereby entering between the teeth of the said working parts to insure the removal of all portions of the fiber and impurities therefrom. The comb-roll is moved either at the same or nearly the same surface speed as the working parts with which it cooperates, whereby the material is removed therefrom and transferred as a coherent or unbroken fleece.

Reference is to be had to the accompanying drawings, wherein—

Figure 1 is a transverse sectional view of sufficient number of parts of a carding-engine to illustrate my invention. Fig. 2 is a like view of a modification of the same. Fig. 3 is a detail face view of the comb-roller shown in Fig. 2. Fig. 4 is a diagrammatic view showing the preferred manner of mounting the teeth on the comb-roller and working roll. Figs. 5^a, 5^b, and 5^c are transverse fragmentary views of parts of a carding-engine, showing modified applications of my invention.

Figure 1 represents a card-clothed comb-roller F in full size and part of the coöperating card-clothed surface of a working roller A on one side and of revolving flat cards D on its other side moving in direction opposite to the direction of movement of the teeth of the comb-roller, as shown by the arrows.

The comb-roller is shown with its teeth rearwardly directed with regard to their direction of motion. This obliquity of the teeth bent in backward direction may be varied, but in every case the teeth must be formed with such an angle as to allow the fleece taken up by the comb-roller to be delivered therefrom entirely or as an unbroken sheet without retaining any portions of the fiber. As the drawings show, the teeth of the comb-roller are penetrating the coöperating card-surface about one-eighth of an inch. However, they may penetrate to any desired degree so long as the fleece does not remain on the comb-roller when the structure is in operation. It will be obvious that only the outer ends of the teeth—that is, as far as they penetrate the coöperating card-clothing—must be bent in backward direction, while the remaining part, which does not come into contact, may be formed in any desired shape or the teeth of the comb-roller may be stuffed nearly up to their full length—that is, with

the exception of their outer ends, where they are penetrating.

Figs. 2 and 3 show another comb-roller applied to act upon a doffer P. Instead of being furnished with cards this comb-roller is composed of disks made of sheet-iron or steel, which are formed with teeth having a saw-like shape, being stuck upon a shaft and spaced at equal distances apart by intermediate plates.

Comb-rollers having teeth as shown in Fig. 2 are only adapted for removing and transferring material, while a comb-roller supplied with teeth as shown in Fig. 1 is capable of acting in a twofold manner—that is to say, it can act as a worker for the drum when arranged near the drum, so that its teeth can take up a portion of the material therefrom in the same manner as the teeth of an ordinary worker.

The manner in which I prefer to mount the card-teeth on the comb-roller is illustrated by Fig. 4, which shows a part of a roller with a fillet wound upon it showing the card-teeth set in rows *a a* parallel with the axis of the roller, so that the arms and elbows of the teeth are radial to this axis, this position of the teeth having proved most advantageous in the use of the comb-roller.

The working roller A and flat cards D, (shown in Fig. 1,) as well as the doffer P, (shown in Fig. 2,) having their teeth rearwardly directed with regard to their direction of motion, work with the main cylinder or drum of a carding-engine.

The surface speed of the comb-roller is the same or nearly the same as that of the cooperating working roller, doffer, or flat cards, whereby the fleece taken up by the comb-roller and adhering loosely to the surface of the same may be delivered therefrom as an unbroken sheet at the points, as indicated by arrows in Figs. 1 and 2, and the fleece is removed therefrom by a comb or other card-clothed rollers.

The comb-roller may be arranged so as to act on two card-clothed surfaces, and in that case the material taken up by the comb-roller from one of the said two card-clothed surfaces may be removed from the comb-roller by the other. Thus, for instance, the fleece taken up by the comb-roller F from the working roller A in Fig. 1 may be removed from the comb-roller by the flat cards D, and, vice versa, the fleece coming from the latter may be transferred to the working roller A in turn. Moreover, the fleece taken up by the comb-roller may be carried around with the same and delivered back again to the same roller from which it was taken. For instance, the fleece taken from the doffer P in Fig. 2 if not removed therefrom by a comb or other card-clothed roller will be carried around with the comb-roller until it comes into contact with the doffer P again, which then removes it, and so of course the material can be taken from the comb-roller in turn in the same manner by a working roller A or flat cards D, as shown in Fig. 1.

Reference is now made to Figs. 5^a, 5^b, and 5^c, which show the comb-roll in various positions as applied to the doffer, working rollers, and drum of a carding-engine and wherein each arrangement constitutes a distinct modification, which may be used alone or in conjunction with one or more of the other modifications described. In these drawings the same reference-letters are used to designate the same or like parts wherever they are repeated. Figs. 5^a, 5^b, and 5^c show a part of a doffer P with the comb-roller F arranged close to it, to which motion is imparted, preferably, from the shaft of the doffer P by a wheel R, which is fast upon the said shaft and engages with the intermediate wheel R′, the latter engaging with the wheel which is fixed on the axle of the comb-roll. The comb-roll shown in these figures is provided with card-clothing which penetrates that of the doffer P and takes therefrom a full and complete layer of material, running at the same or nearly the same surface speed as the doffer P and with its teeth in direction opposite to the adjacent surface of the doffer, as indicated by the arrows. In Fig. 5^a the layer of material taken off by the comb-roll F from the doffer *p* is then transmitted to the two guiding or feed rolls *c c*, from which it may be removed or delivered. In Fig. 5^b the comb-roll F has applied to it a stripping-roller E in order to take the fleece from the comb-roller F and deliver it in the direction of the arrow. The comb-roller F (shown in Fig. 5^c) takes a layer of material out of the doffer P, and without any intermediary returns it to the doffer, from which it may be taken afterward.

The workers A and the comb-rolls F may be furnished with the same card clothing or garniture, and the comb-roller F may also be of the same diameter as the workers A.

It will be observed that in all of the forms of fly-rollers shown the teeth slope rearwardly with respect to their direction of motion—that is to say, each is provided with a surface inclined rearwardly with respect to the direction of rotation of the tooth.

I would have it understood that I do not limit myself to the particular arrangements of rollers as shown in the drawings, and that the comb-roll may be applied to act on the card-clothed surface either of rollers or traveling flat cards which may be arranged in any other way, but having their teeth rearwardly directed with regard to their direction of motion and moving opposite to the teeth of the comb-roll with which they coöperate.

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

1. In a carding-engine, the combination of a moving card-surface having teeth which are rearwardly directed with respect to their direction of motion, a comb-roller consisting of a roller having teeth sloping in a direction rearward with regard to their direction of

motion, said comb-roller being arranged close to the said moving card-surface so that its teeth shall penetrate the said card-clothed surface, means for driving the comb-roller and the card-clothed surface in such directions that the penetrating teeth of the comb-roller shall be moved opposite to those of the card-clothed surface at their contacting point and at the same or nearly the same surface speed, to strip the material from the said card-clothed surface in an unbroken coherent layer, thereby continuously cleaning the working parts of all waste and dirt.

2. In a carding-engine, the combination of a moving card-surface and means for moving the same, of a comb-roller having teeth sloping rearwardly with respect to their direction of motion, the teeth of the comb-roller penetrating the said card-clothed surface and means for driving the comb-roller and card-clothed surface at substantially the same rate of speed and in directions opposite to each other at the point of contact of the said comb-roller and card-clothed surface, whereby the material will be stripped from the card-clothed surface in an unbroken coherent layer, thereby continuously cleaning the working parts of all waste and dirt.

ERNST GESSNER.

In presence of—
EMANUEL PRESUHN,
ERNST KEHR.