

E. H. ROONEY.
MACHINE FOR WORKING COTTON WASTE.
APPLICATION FILED OCT. 4, 1911.

1,061,327.

Patented May 13, 1913.

4 SHEETS—SHEET 1.

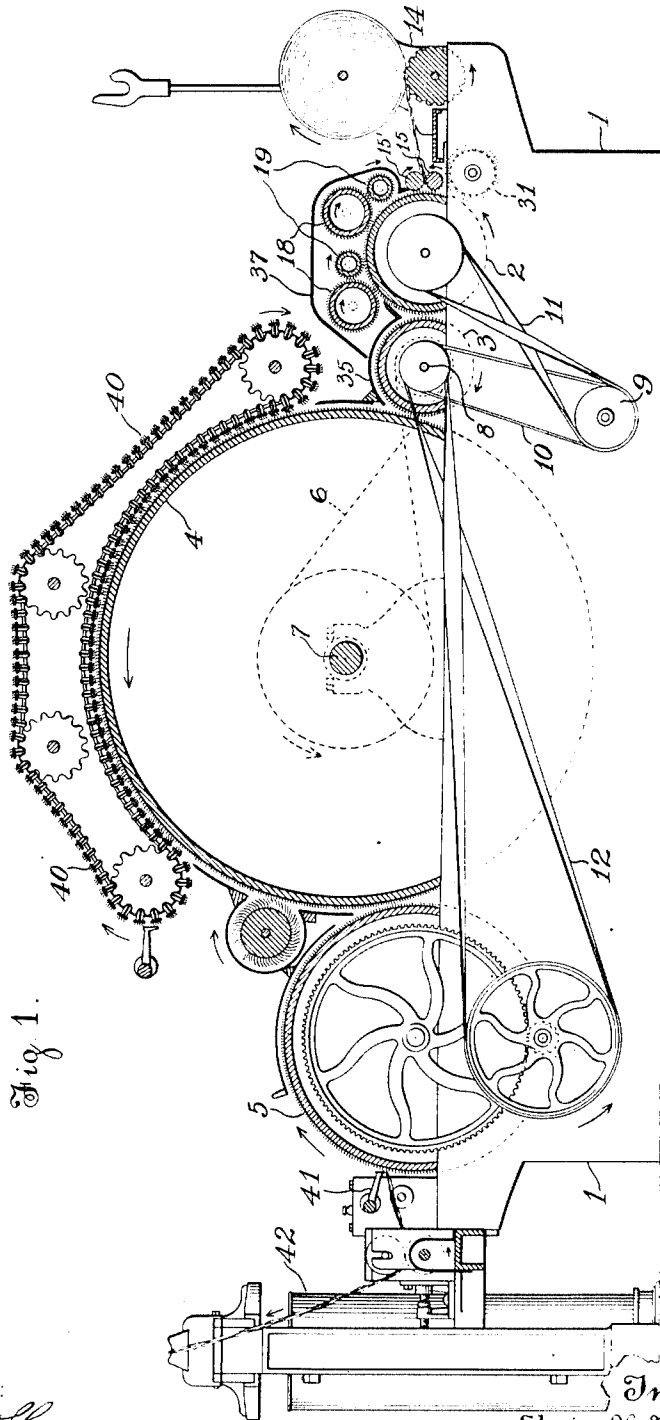


Fig. 1.

2 Witnesses:
Leon H. Horner
Oscar L. Owen.

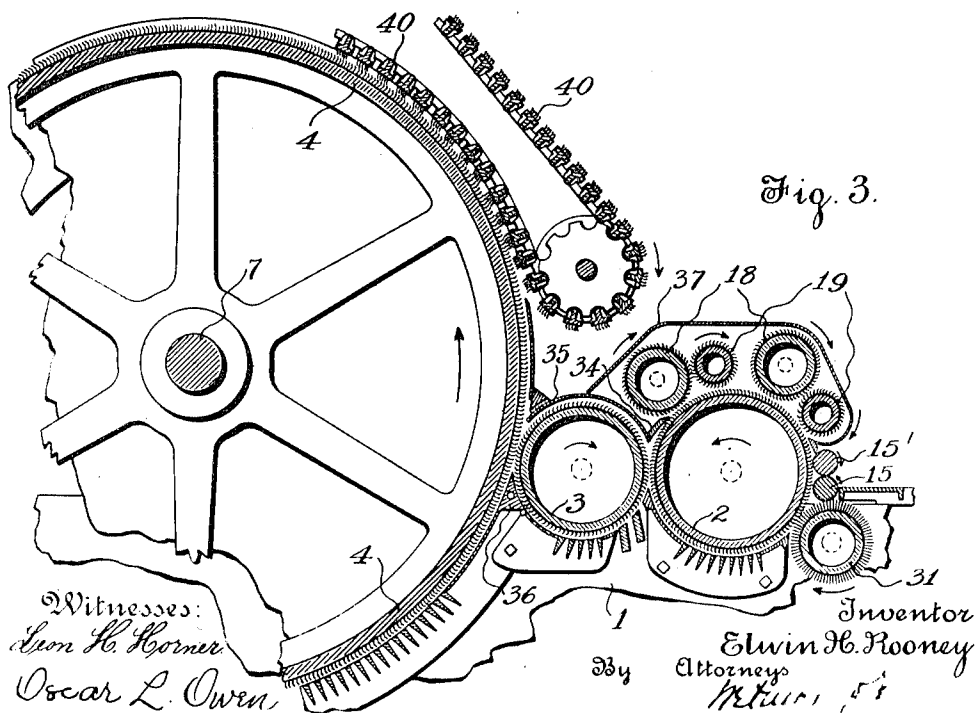
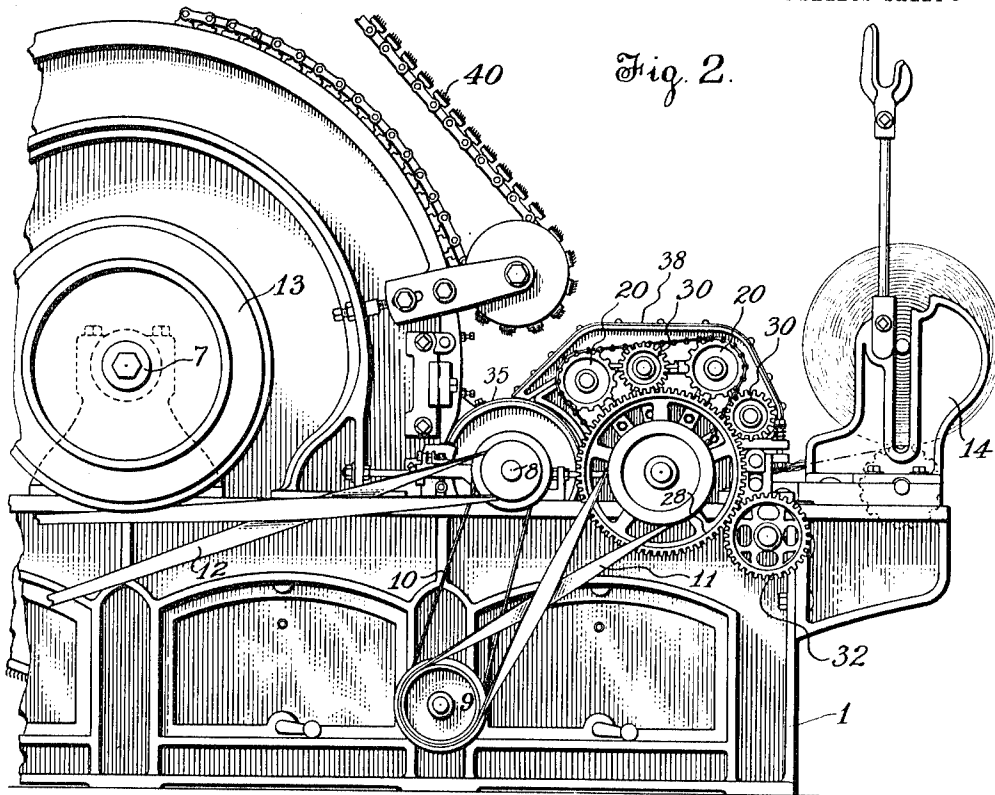
Inventor:
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4 SHEETS-SHEET 2

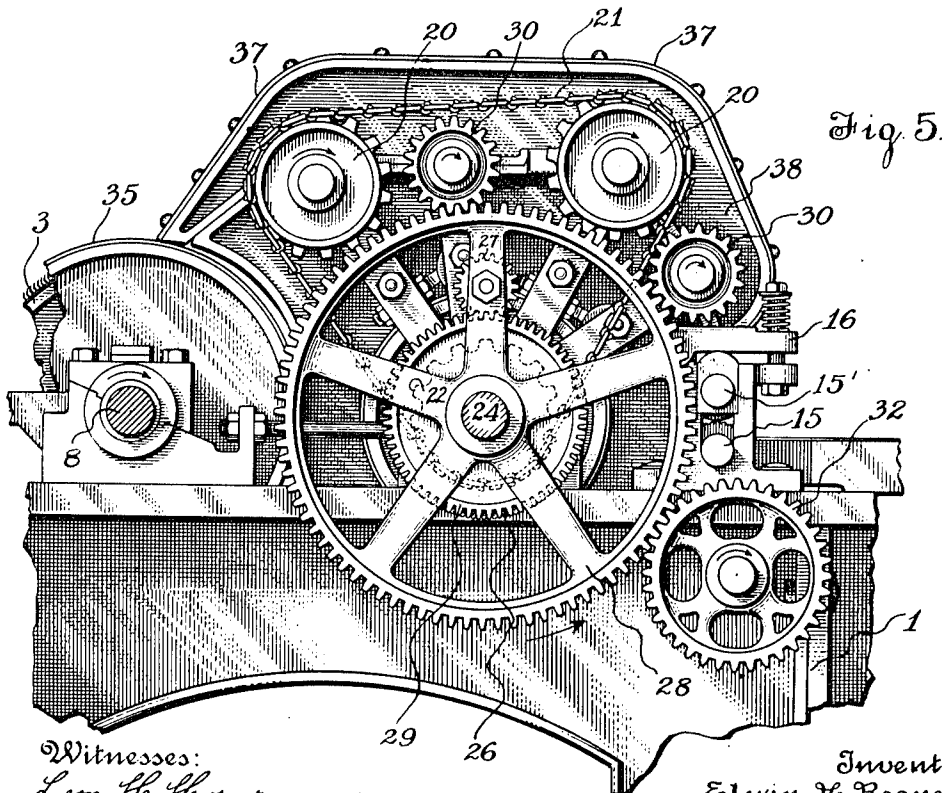
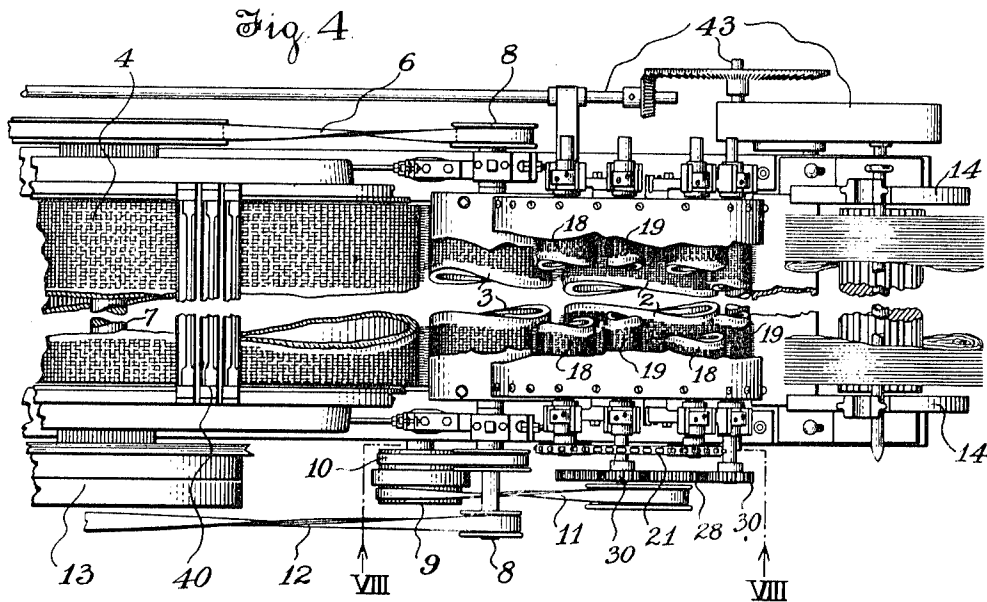


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4 SHEETS—SHEET 3.



Witnesses:
Leon H. Horner.
Oscar L. Owen.

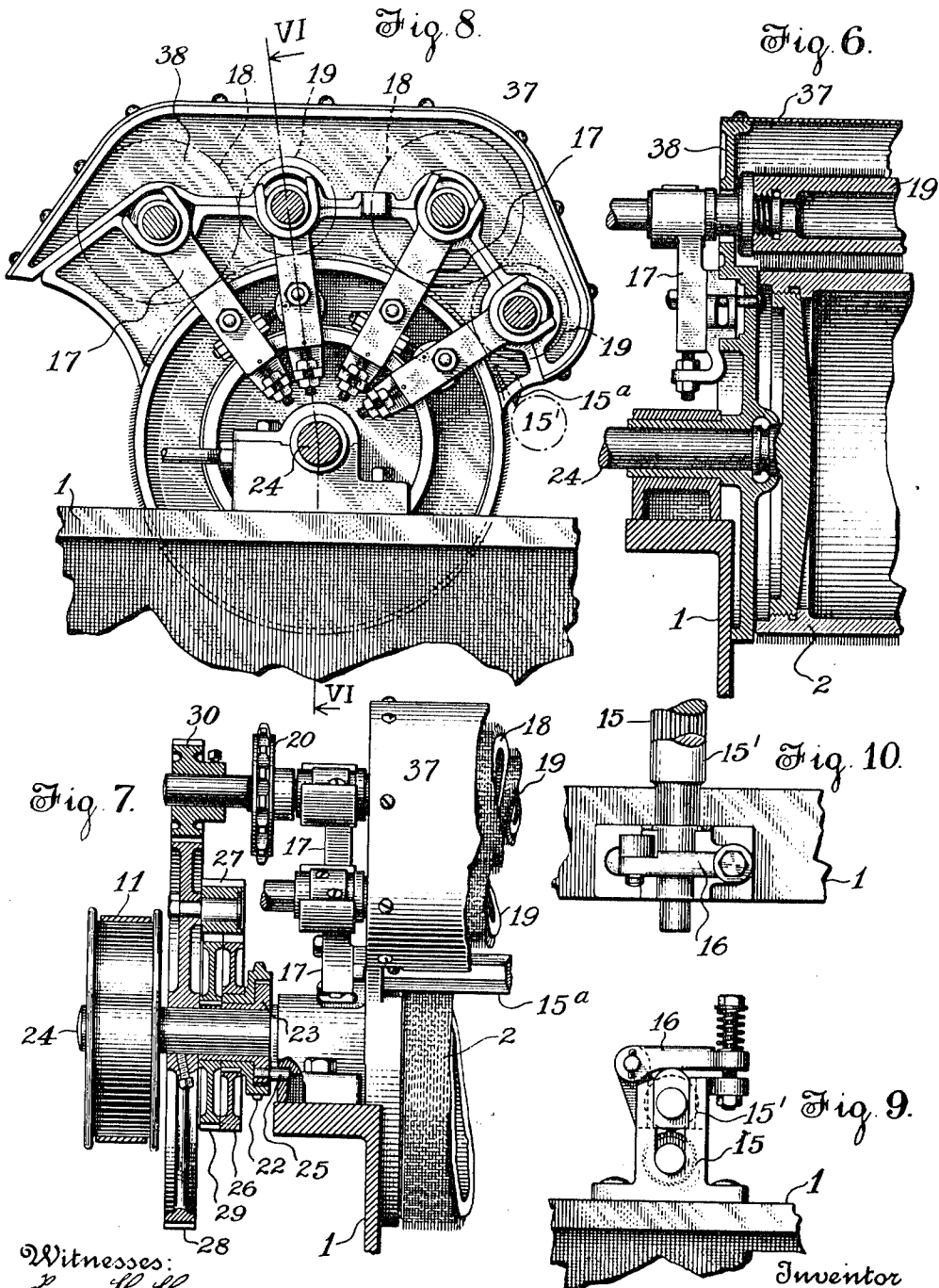
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ELWIN H. ROONEY, OF WHITINSVILLE, MASSACHUSETTS, ASSIGNOR TO THE WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MACHINE FOR WORKING COTTON-WASTE.

1,061,327.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed October 4, 1911. Serial No. 652,777.

To all whom it may concern:

Be it known that I, ELWIN H. ROONEY, a citizen of the United States, residing in Whitinsville, county of Worcester, and State of Massachusetts, have invented the new and useful Improvements in Machines for Working Cotton-Waste, described in the following specification.

The invention seeks to overcome the well known difficulties in carding waste or broken-fiber cotton into uniform sliver, and consists of a novel combination of carding and fiber-working elements which cooperate to exercise a desired selection between the longer, useful, fibers and the short and useless broken ends of fibers and dirt, both of which are intimately mixed together in the waste. The new machine produces sliver from the former without the formation of thick spots or bunches, and discharges the dirt and useless material in the form of refuse. So far as I am aware, this result has not been heretofore accomplished, and it has not been possible to recover the better fibers of the waste, free from the dirt and without bunches, save by repeated carding and combing, and with a consequent increase in the expense of manipulation. It has therefore commonly been the practice to utilize such waste by mixing it in small proportions with good cotton, so that in the working of the latter it becomes so mixed in and dispersed throughout the good fibers that its imperfections are not noticeable. This method of disposing of waste cotton, however, is troublesome to the operator and is also inefficient as is now well recognized, because the fibers of the waste become impaired by the repeated workings. By this invention, I am enabled to produce a sliver composed entirely of waste cotton and which is free from bunches or thick spots, making a pure waste roving which is equal, if not better, than any possible to obtain from cotton waste in any other way, and produced with far less expense.

In the four sheets of drawings forming part of this specification, Figure 1 is a side elevation of a machine constructed in accordance with this invention with the upper portion in section to illustrate the general arrangement; Fig. 2 is an enlarged side elevation of one end of the same machine; Fig. 3 a view of the same end in vertical longitudinal section; Fig. 4 a top plan view of

the parts shown in Fig. 3, with intermediate portions broken out; Fig. 5 is a still further enlarged side elevation of one end of the machine, illustrating in detail features of the gearing; Fig. 6 is a transverse section on line VI—VI of Fig. 8 of one side of the machine; Fig. 7 a similar view showing also the planetary gear motion for driving the worker rolls; Fig. 8 an enlarged section view on line VIII—VIII of Fig. 4, showing the supports for the worker and stripper rolls; Figs. 9 and 10 are respectively side elevation and top plan views of the feed roll mounting.

On the base-frame 1 are journaled four cylinders, marked 2, 3, 4 and 5 respectively, each of which is covered with card-clothing such as commonly used in ordinary carding machines, with the teeth of the clothing arranged on each cylinder as indicated in the drawing, so that when driven at properly adjusted surface speeds each cylinder will doff to the one next in the series, from the cylinder 2 to the cylinder 5. The gearing for driving the cylinders at the proper speeds comprises a belt 6 driven by the main power shaft 7 of cylinder 4, which drives the shaft 8 of the cylinder 3. The opposite end of this shaft is belted to an idler 9 by means of a belt 10, and from this idler the second cylinder is driven by a cross-belt 11, the cylinder 5 being driven direct from the shaft 8 by a crossed-belt 12. Power is applied to the main axle 7 at the drive-pulley 13. The waste cotton is supplied from a roll support 14 and passes thence to a pair of feed rollers 15 and 15', by which it is presented to the card teeth on the cylinder 2, which is the first in the series and the slowest in speed. The lowermost of the two feed-rolls 15 is rotated on a stationary axis by means of any suitable form of gearing, indicated at 43 in Fig. 4, and the upper roll is held on top of the lower roll by means of a spring-pressed lever 16, as clearly indicated in the detail views of Figs. 9 and 10. The upper portion of cylinder 2 is surmounted by a series of four smaller cylinders 18 and 19 constituting worker and stripper rolls respectively, each of which rests by its extended axle in an independent journal bracket, marked 17 in the drawings (see Fig. 8).

The two rolls marked 18 are worker rolls and are covered with card clothing, the

teeth of which are pointed against the teeth of the cylinder 2, and these rolls are set close to the working surface of the cylinder 2, receiving a slow rotary motion in the direction of the arrow. The two other rolls 19 are 5 stripper rolls, and the teeth of their card clothing are pointed in the same direction as the teeth on the large cylinder 2. These rolls are set close to the cylinder 2, one in front of 10 each worker roll, and revolve in the direction of the arrows, each at a higher surface speed than its adjacent worker roll. The waste cotton delivered to the cylinder 2 by the feed rolls is carried upwardly thereon 15 into the action of the first and second workers, and such fibers or bunches of fibers as project sufficiently far above the card teeth to encounter the card teeth of the workers are caught thereon and carried around 20 thereby in a reverse direction, until they are picked off by the more rapidly revolving stripper rolls and replaced by the latter on the large cylinder 2, whereon they remain if sufficiently loosened and separated. 25 Otherwise they are again caught on one or the other worker and returned again to the large cylinder 2, and so on, the working and stripping action being repeated continuously on each projecting bunch of fiber until 30 the individual fibers thereof lie smooth enough to pass the workers. The second worker is set somewhat closer to the cylinder 2 than the first.

The slow motion is imparted to the worker 35 rolls by means of the sprocket wheels 20 secured to their axles and engaged by a common sprocket chain 21 which is driven by a driving sprocket 22 (Fig. 7). This sprocket is mounted to rotate co-axially with the 40 large cylinder 2 but independently thereof. As shown more clearly in Figs. 5 and 7, it is journaled on a sleeve 23 mounted on the shaft 24 of the cylinder 2 and held from revolving therewith by means of a pin 25. A 45 spur gear 26 is concentrically fastened to the sprocket wheel and driven by a long planetary pinion 27 which is carried by a large spur gear 28, the latter being fast on the cylinder shaft 24 and revolving there- 50 with. The planetary pinion on this gear travels around a sun-gear 29, which is keyed to the sleeve 23, being therefore stationary, and its engagement also with sprocket spur gear 26, which has one less tooth than the 55 sun-gear, causes the said gear 26 and its connected sprocket 22 to be thereby rotated backwardly the distance of one tooth for each complete revolution of the large gear 28, as will be well understood. The sprocket 60 chain thus receives a slow motion. The large spur gear 28 serves also to drive the stripper rolls 19, being directly geared to the pinions 30 which are fast on the axles of the latter, so that the said rolls thus re- 65 ceive their high speed rotation in the proper

direction. Beneath the feed rolls 15 there is a clearer brush 31 for the cylinder 2, which is also driven by the spur gear 28 through its axle gear 32 meshing therewith. The upper feed roll 15' is provided with a 70 smooth cylindrical surface, which cooperates with the fluted surface of the lower roll and is also provided with a clearer blade 15^a engaging the upper side of the roll to keep it clear of adhering accumulations. The 75 smooth surface of the upper roll forms a bed against which the teeth of the cylinder 2 act on the fiber and aids in preventing bunches of waste from entering into the workers and strippers.

The cotton fibers adhering to the surface 80 of the cylinder 2, having been distributed and worked down to a smooth fleece thereon by the action of the rolls 18 and 19, passes from beneath the second worker roll, under 85 clearer blade 34 which is set closely up into the converging space between the said worker roll and the face of the cylinder, with its edge in close proximity to the card teeth 90 points of both the roll and cylinder. On reaching the point of least separation between the cylinder 2 and the next cylinder 3, the fleece is taken from the former onto the 95 latter, by virtue of the higher surface speed of the cylinder 3, and is carried on the under side of the latter around and toward the main cylinder 4, on which it is next deposited in like manner and with its fibers in the same uniformly distributed condition. 100 The cylinder 3 is a transfer cylinder adapted to convey the fleece of fibers from the first cylinder to the third. Its upper surface is covered by a casing 35 which may be of sheet metal, bridging the space be- 105 tween the first and third cylinder and extending well down into the converging spaces between the first and second cylinders and also between the second and third cylinders, as clearly shown in Fig. 3. One 110 edge of the casing lies directly beneath the second worker roll 18 and is in substantial contact with the clearer blade 34, forming a wedge-shaped projection with the lower part of the latter which substantially fills the converging space between the first and 115 second cylinders. This wedge-shaped projection preferably extends even closer to the surfaces of the cylinder 2 than indicated in the drawings, as does also the clearer blade 34, being preferably within less than a 120 fiber's length from the card teeth in both cases, which disposition prevents the formation of fluff rolls, which would otherwise form and fall into the fleece, producing bunches or thick spots therein that would 125 not be removed by the subsequent operations effected upon it. From the clearer-blade 34 to the junction of the second and third cylinders, the casing 35 is continuous and is also set close to the working surface of the 130

intermediate cylinder, extending as a clearer blade well down toward the doffing line. The under sides of all three cylinders are provided with curved bottom walls slitted to let the dirt out and also extended more or less upwardly into the converging spaces between the rolls, as indicated at 36, and the ends of the cylinders and the spaces between the cylinders are closed in by suitable side walls rising from the walls of the base frame 1.

A casing 37 surmounts the worker and stripper rolls and overhangs the greater part of the intermediate casing 35, being provided with end-walls 38 (see Figs. 6 and 8) which rest upon the permanent side walls of the cylinder 2 and over the bearings of the several worker and stripper rolls, forming therewith a complete inclosure for the working surfaces of the card clothing.

The fleece taken from the transfer cylinder 3 by the cylinder 4 is carried by the latter upwardly and beneath a chain of revolving top-flats 40 which exert a carding action thereon in the ordinary carding manner not requiring description. From the cylinders 4 the carded fibers are doffed by the doffer cylinder 5, and from the latter they are removed in the form of a continuous sliver by means of the doffer comb 41, thence passing in the usual manner to the sliver can 42. The top flats 40 are driven slowly in the direction of movement of the cylinder 4 by any suitable means, not indicated in the drawings, but which may be the same as the ordinary carding machine. The action of the top-flats on the fibers is supplemental to that of the worker and stripper rolls, and removes from the fleece the short fibers and dirt which have passed through the worker rolls and on which the said rolls have had no other than a distributing function.

It will thus be seen that in the combination above described the waste cotton is first loosened and spread out in the form of fleece on the first cylinder and without the removal of any substantial part of the dirt and useless fiber it contains, and that it is thereafter transferred in this uniform condition to the action of the top-flats, which catch and retain the short fibers and dirt, delivering them finally to a baling shaft or a box placed for the purpose beneath one end of the chain, while the good fibers pass on to the sliver-can in the form of sliver. A doffer comb serves to strip the dirt from the top flats.

It will, of course, be understood that the form and proportions of the several parts, as well as the gearing and the number of working and stripping rolls, may be varied

from the exemplification above described without departing from the invention.

I claim:

1. A machine for carding waste cotton fibers comprising a first cylinder provided with feed rolls and a series of pairs of worker and stripper rolls coöperating therewith and adapted to form a uniform fleece on said first cylinder, a second cylinder operating to transfer such fleece to a third cylinder, a series of revolving top-flats co-operating with said third cylinder acting to separate the dirt and shorter fibers from said fleece, a doffer cylinder co-acting with the third cylinder and means for conducting the fleece therefrom in the form of carded sliver.

2. A machine for carding waste cotton comprising a series of three, card clothed cylinders each speeded to doff to the next in the series, a series of worker and stripper rolls mounted above and coöperating with the slowest speed cylinder and a series of revolving top-flats arranged above and co-operating with the third cylinder, in combination with a curved casing bridging the space between the workers and strippers and said top flats and provided with wedge shape fillers extended into the converging spaces between the said three rolls and operating to prevent the formation of fluff rolls therein.

3. A machine of the class specified having two card-clothed cylinders and an intermediate transfer cylinder adapted to transfer fleece from one to the other, worker and stripper rolls coöperating with the cylinder of slowest speed and revolving top-flats co-operating with the cylinder of higher speed, in combination with a driving connection between the said two cylinders whereby the one drives the other, intermediate gearing for said transfer cylinder and differential gearing for driving the said worker rolls.

4. In a machine of the class described, a series of three or more card-clothed cylinders and means for driving them whereby each doffs to the next in the series, a series of worker and stripper rolls co-acting with the first cylinder and means for driving the same comprising a gear fast on the shaft of the first cylinder and directly driving the stripper rolls and a planetary pinion revolving with said gear connected to drive the worker rolls.

In testimony whereof, I have signed this specification in the presence of two witnesses.

ELWIN H. ROONEY.

Witnesses:

OSCAR L. OWEN,
HARMON O. NELSON.