E. H. ROONEY.

CARDING MACHINE.

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1,380,022. **Patented May 31, 1921.**

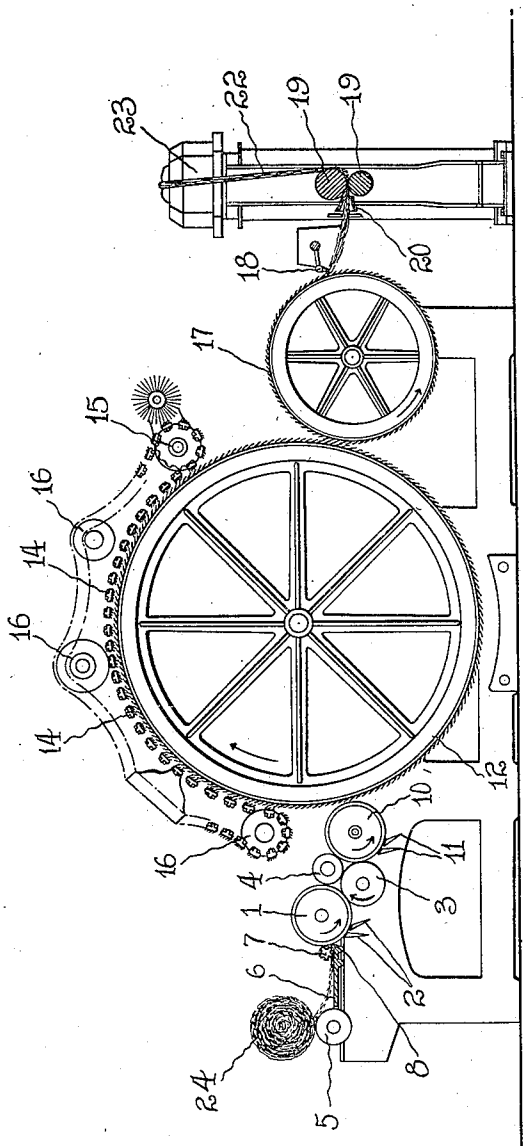

Fig. 1

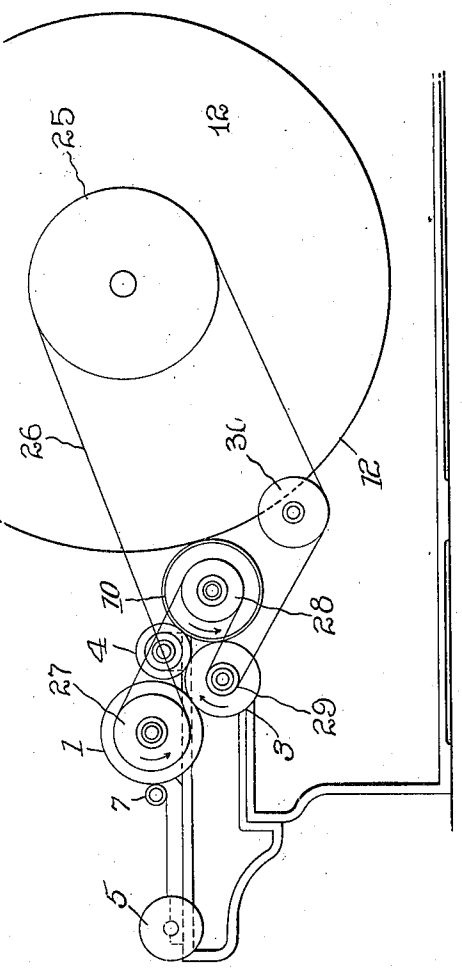

Fig. 2.

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By his Attorney

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UNITED STATES PATENT OFFICE.

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CARDING-MACHINE.

1,380,022. Specification of Letters Patent. Patented May 31, 1921.

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To all whom it may concern:

Be it known that I, ELWIN H. ROONEY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Carding-Machines, of which the following is a specification.

This invention relates to improvements in the arrangement and construction of cleaning and carding mechanisms adapted for the cleaning and carding of cotton, cotton waste or other vegetable fiber and forming it into a sliver preparatory to the spinning operation. The improved features of my present invention are particularly valuable and advantageous when incorporated in the well-known type of machine known as the revolving flat card. A particular feature of the improvements of the present invention consists in the provision of a supplementary licker-in in an improved arrangement which is operative to co-act with the usual licker-in of the card and is operative to effect an initial cleaning of the trash from the cotton and to parallelize the fibers whereby the operation of the succeeding or usual licker-in is more thorough in its cleaning action. As a result the fibers delivered to the cylinder are in a greatly improved condition both as to parallelism and as to cleanliness whereby the subsequent cleaning and parallelizing action of the flats will be improved to a degree which ordinarily will eliminate the requirements and necessity of double carding.

As will be understood in the revolving flat card mechanisms, the cleaning operation is mainly effected in two different manners and at two different places; first, by the mote knives of the usual licker-in and secondarily by the flats, for the mote knives do not effect sufficient cleaning and moreover in the ordinary type of flat card it is customary to employ the double carding operation to obtain a satisfactorily cleaned and conditioned sliver which involves added labor and power and interruption in the continuity of the operation. A particularly objectionable and costly factor incidental to double carding arises from the necessity of converting the sliver after the first stage of cleaning to lap form preparatory to the second stage which is accompanied by the necessity of employing doubling machines and a considerable amount of labor in connection therewith.

In my improved arrangement I desirably employ a supplementary licker-in mechanism arranged in advance of and in tandem relation with the usual licker-in associated with the cylinder. The supplementary licker-in has associated therewith a feeding device adapted to advance the stock thereto from a lap roll and between the advance licker-in and the usual licker-in there is interposed a suitable carrier or transfer roll adapted to transfer the fiber from the one licker-in to the other. In co-acting with the transfer roll there is desirably provided a fancy roll adapted to raise the fibers of the carrier roll and facilitate their transfer to the regular licker-in. The advance licker-in mechanism thus provided is operative initially to clean the trash from the fiber and to rearrange the fibers whereby they are delivered to the regular licker-in in a materially improved condition thereby to contribute to the effectiveness of the succeeding cleaning and parallelizing operations in the regular card to a degree sufficient to obtain a satisfactory product by a single and continuous carding operation. As will be readily understood this subsequent or succeeding action upon the fibers in the regular card will be the usual combing of the fibers by the licker-in and cleaning action by the mote knives thereof and the further combing and cleaning of the fibers upon the cylinder coöperating with the flats but that the efficiency of the regular card in its action will be greatly increased in proportion to the cleaning and preparation of the fibers in the advance licker-in attachment of my invention.

An approved embodiment of my invention is illustrated in the accompanying drawing wherein all the reference numerals of this description are applied to the corresponding parts in the several views.

In the drawing, Figure 1 is a diagrammatic vertical longitudinal sectional view illustrating a desirable embodiment of my invention and Fig. 2 is a diagrammatic view in side elevation illustrating a desirably operating means therefor.

The principal operating features of the carding machine as heretofore employed

and in combination with which I have illustrated the features of my present invention consist of the usual toothed licker-in 10 having the usual teeth (not shown) on its peripheral surface which comb the fibers and carry the cotton past the mote knives 11—11. These mote knives operate to remove short fibers and trash such as sand, leaves, seeds, etc., and from the licker-in the cotton passes to the large cylinder 12 provided with suitable wire clothing on its periphery which operate to strip the fibers from the licker-in and to co-act with similar but reversely inclined wire clothing of the usual transversely arranged flats 14. These flats 14 are connected to form an endless chain and supported upon a sprocket drum 15 and suitable idlers 16—16 by which the flats are operated at a lower speed than the cylinder so as to produce a combing action therebetween. From the cylinder the cotton is delivered to the doffer 17 from which it is stripped in the usual manner by an oscillating comb 18 and drawn by the calender rolls 19—19 through a forming trumpet 20 from whence it passes as the sliver 22 into the usual coiler 23. The licker-in, cylinder and doffer are rotated in the directions indicated by arrows at suitable speed and by means of the usual driving connections not shown.

In accordance with my present invention I have incorporated with the foregoing features of the card an advance licker-in cylinder 1 having the usual mote knives 2 cooperating therewith. This advance licker-in is arranged in tandem or series arrangement with the regular licker-in 10 and interposed between the respective lickers-in there is provided a transfer or carrier roll 3 which is desirably covered with garnett wire similar to the clothing of the lickers-in and is set with relation to the lickers-in and suitably rotated to transfer the fibers from the advance licker-in 1 to the second licker-in 10. At 4 there is indicated a revolving brush or fancy roll which is positioned to co-act with the carrier roll 3 to raise the stock in the wires of the carrier roll to facilitate their transfer from the latter licker-in 10.

A further important feature of my improved combination consists in the particular means employed for delivering the stock to the advance licker-in which is of a character to co-act with the advance licker-in cylinder in a manner whereby the delivery of the stock to the licker-in cylinder 1 is accompanied by a substantial parallelizing action. In consequence there is an initial and effective parallelizing of the fibers which is conducive of a more thorough removal of the trash by the mote knives 2 and further contributes to the more successful cleaning and parallelizing in the subsequent operations. To this end the delivery means employed consists of the usual lap roll 5 which delivers the lap over the feed plate 6 from whence it is delivered by means of a fluted feed roll 7 over a nosing portion 8 of the feed plate to the licker-in cylinder 1. As will be noted the nosing portion 8 of the feed plate is upturned and set in close proximity to the licker-in cylinder 1 whereby the action of the teeth of the licker-in cylinder in taking the stock from the feed plate will be instrumental in producing a combing action in drawing the fibers over the nosing edge.

As illustrated, 24 indicates the usual roll of lap suitably supported to bear upon the feed roll 5. The respective parts are arranged to rotate as indicated by the arrows whereby the resulting operation is that the lap 24 is advanced over the feed plate 6 to the nosing portion 8 from whence it is taken by the licker-in cylinder 1 with the initial combing of parallelizing action aforesaid. The stock is then carried downwardly over the mote knives 2 and the initial cleaning action performed. From the licker-in cylinder 1 the stock passes to the carrier roll 3 and is carried over said roll to be acted upon by the fancy roll 4 and from the carrier roll 3 is delivered to the second licker-in cylinder 10. The latter cylinder as indicated carries the stock downwardly to be acted upon by the cleaning mote knives 11 and from the cylinder 10 the fibers are taken by the usual main cylinder 12 which carries the stock upwardly and co-acts with the usual flats 14 to further clean and parallelize the fibers. From the main cylinder the stock is then transferred to the doffer 17 from which it is stripped by the stripper comb 18 and passes through the trumpet 20 to the calender rolls 19 from whence in the form of a sliver 22 the stock passes into the usual coiler 23.

In Fig. 2 I have indicated a suitable manner of operating the respective cylinders from the main cylinder 12 which is provided with a pulley 25 carrying a driving belt 26 which is passed in the manner indicated over pulleys 27 and 28 of the advance and second lickers-in respectively and from the bottom of the latter pulley it is passed over a pulley 29 on the carrier roll and thence to an idler 30 whereby the respective cylinders are rotated in proper speed ratio and direction.

As will be noted the improved features of my invention are capable of being incorporated in the usual card construction in a very compact arrangement with a resulting economy in floor space and is further of a character which does not require a material increase in the power consumed. Moreover, as pointed out, the advance licker-in coöperation with the delivery means and the mote knives effects a parallelizing of the fibers

and an initial cleaning of the trash from the stock to a degree which materially improves the succeeding cleansing action in the second licker-in, whereby the cotton delivered from the second licker-in will be in satisfactory condition to permit of successfully completing the cleaning and parallelizing action in the succeeding operation particularly in the revolving flat type of card illustrated whereby the necessity of double carding and the losses incident thereto are eliminated.

Having described my invention I hereby claim:—

1. In a carding machine the combination of a flat card having a main cylinder and a plurality of licker-in mechanisms associated therewith and arranged in series, said licker-in mechanisms comprising cylinders rotatable in a corresponding direction, and mote knives co-acting with the cylinders, a carrier roll interposed between the respective licker-in cylinders and rotatable reversely with relation thereto to transfer the stock from the advance cylinder to the second licker-in cylinder, a fancy roll positioned above the carrier roll and operating upon the stock thereon and a delivery mechanism adapted to feed a lap to the advance licker-in cylinder, said delivery mechanism comprising a feed plate having a nosing portion in close proximity to the periphery of the advance licker-in whereby the stock is received upon the advance licker-in cylinder with a combing section, substantially as described.

2. In a carding machine the combination of a flat card having a main cylinder and a plurality of licker-in mechanisms associated therewith and arranged in series, said licker-in mechanisms comprising cylinders rotatable in a corresponding direction, and mote knives co-acting with the cylinders, a carrier roll interposed between the respective licker-in cylinders and rotatable reversely with relation thereto to transfer the stock from the advance cylinder to the second licker-in cylinder, a fancy roll positioned above the carrier roll and a delivery mechanism adapted to feed a lap to the advance licker-in cylinder, said delivery mechanism comprising a lap delivery roll, a feed plate positioned in advance thereof and formed with an upwardly curved nosing portion having a delivery edge in close proximity to the periphery of the advance licker-in cylinder whereby the stock will be taken upon said cylinder with a combing action and a feed roll associated with said feed plate nosing portion and adapted to advance the stock thereover, substantially as described.

In testimony whereof I have signed my name to this specification.

ELWIN H. ROONEY.

Witnesses:

ARTHUR P. JOHNSON,

FRANK G. SIMMONS.