

Nov. 3, 1959

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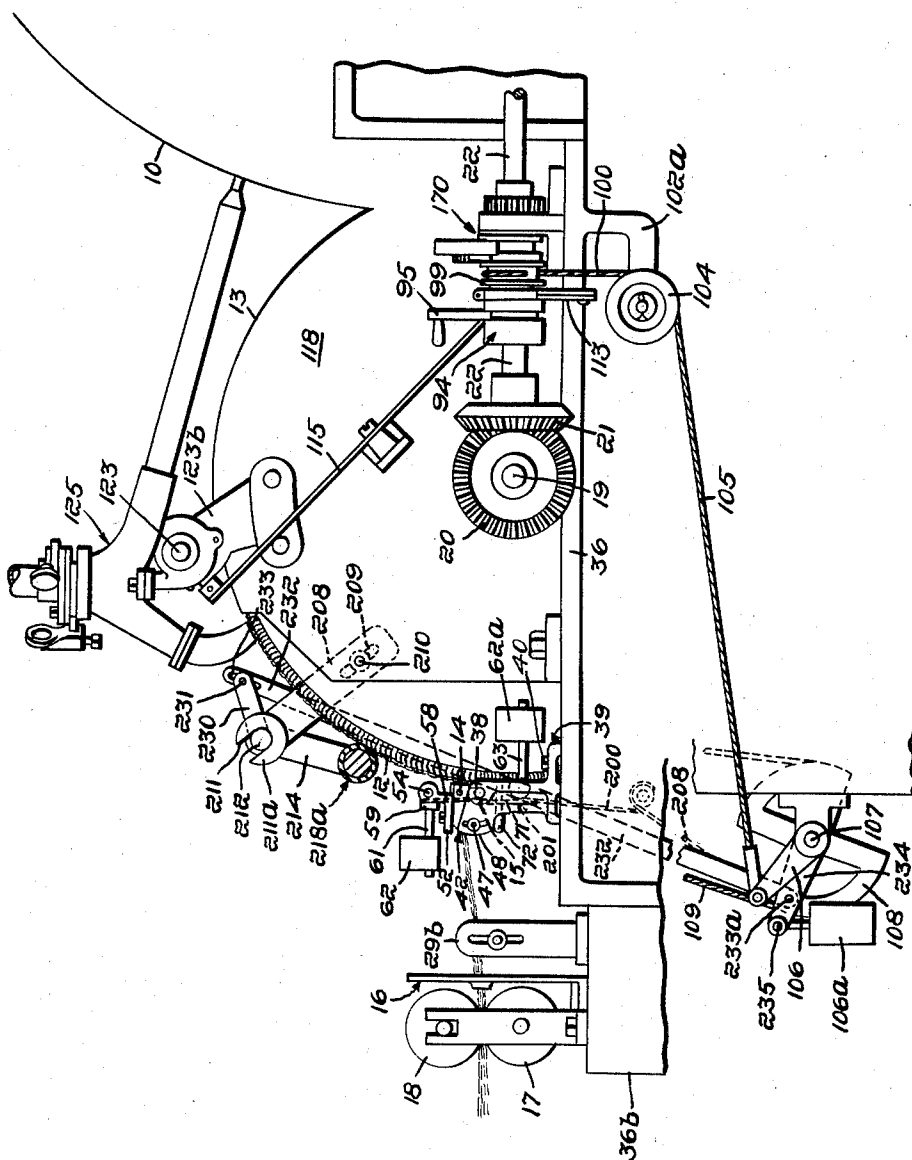
2,910,735

CARDING APPARATUS AND METHOD

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7 Sheets-Sheet 1

Fig. 1.



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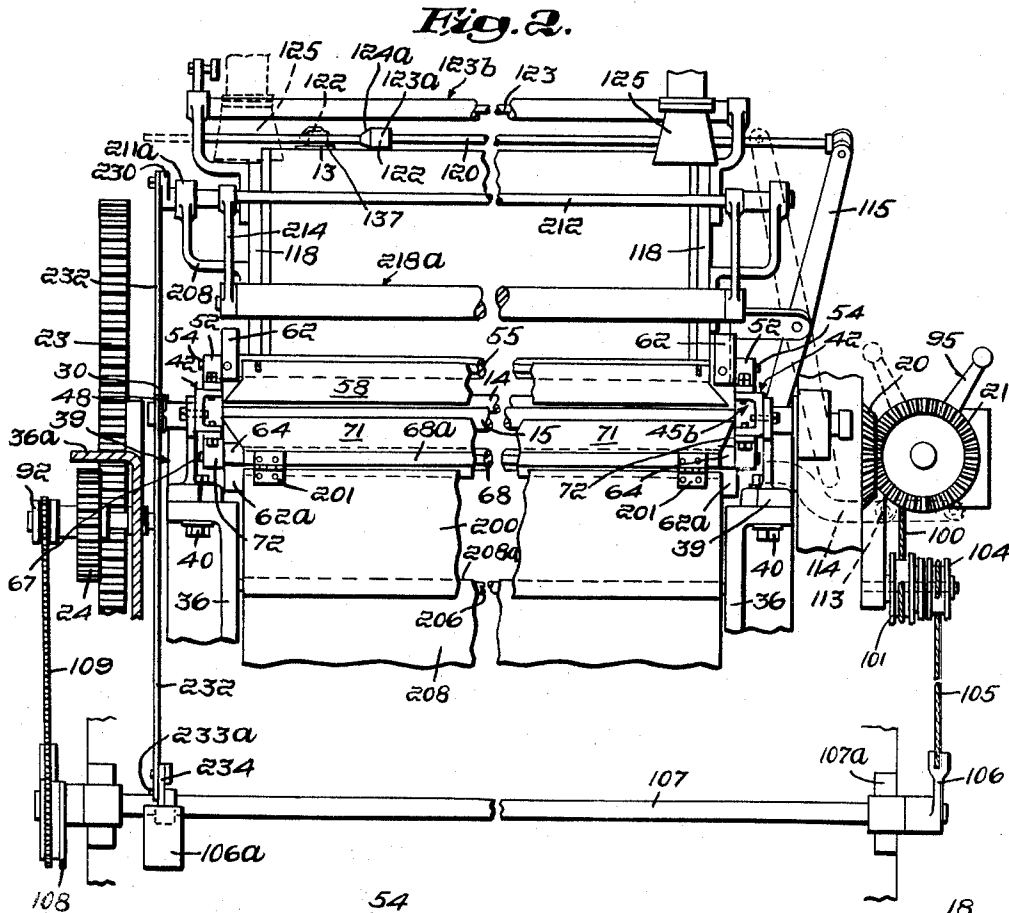
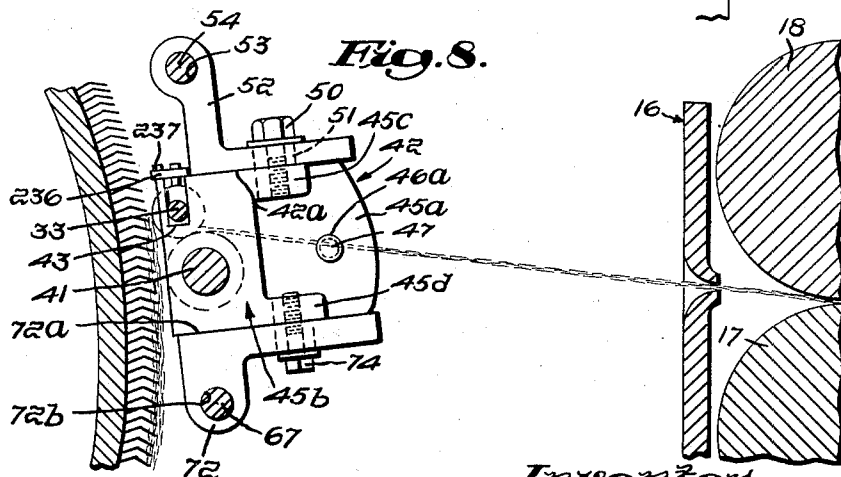
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7 Sheets-Sheet 2



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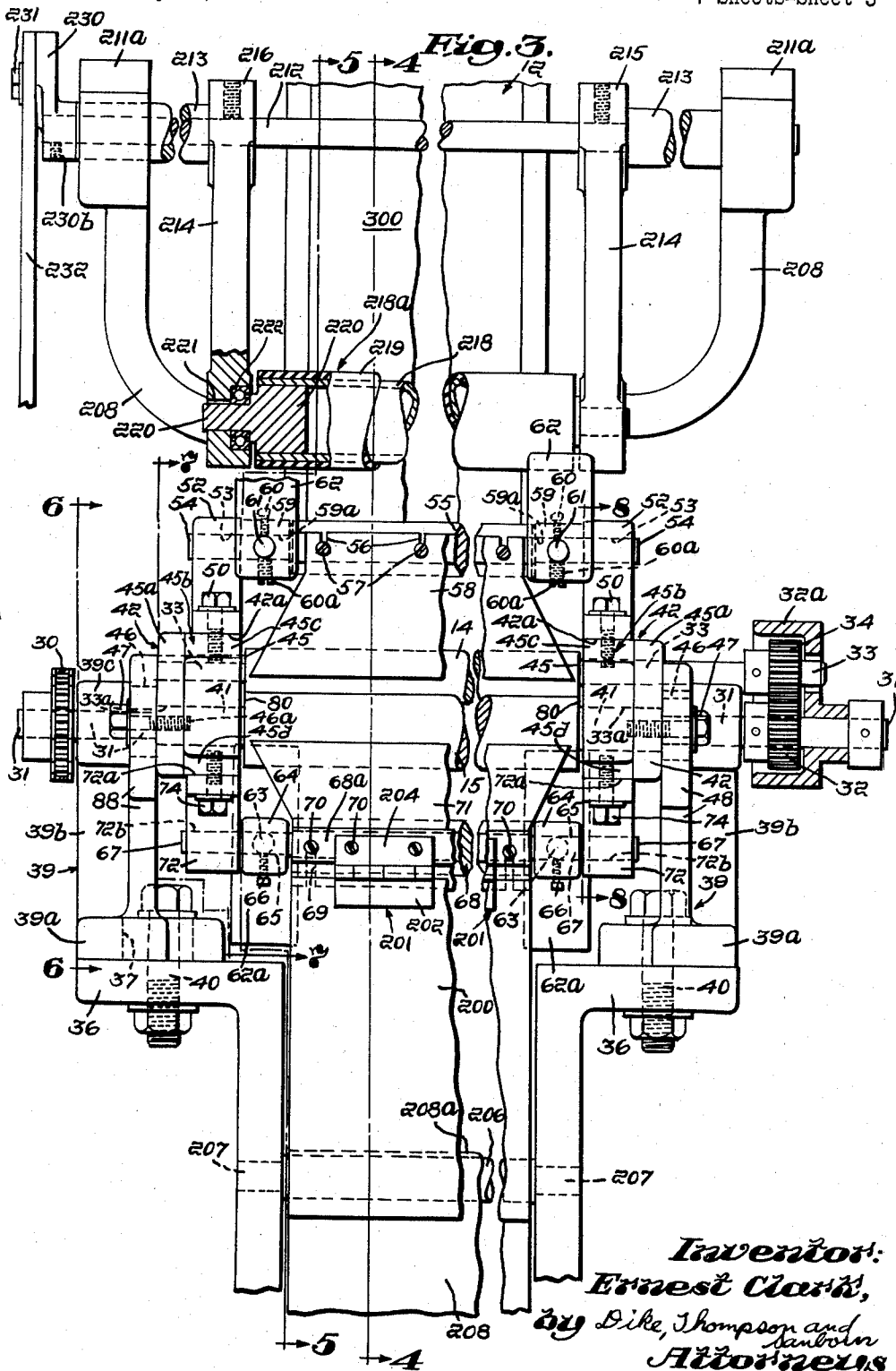
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CARDING APPARATUS AND METHOD

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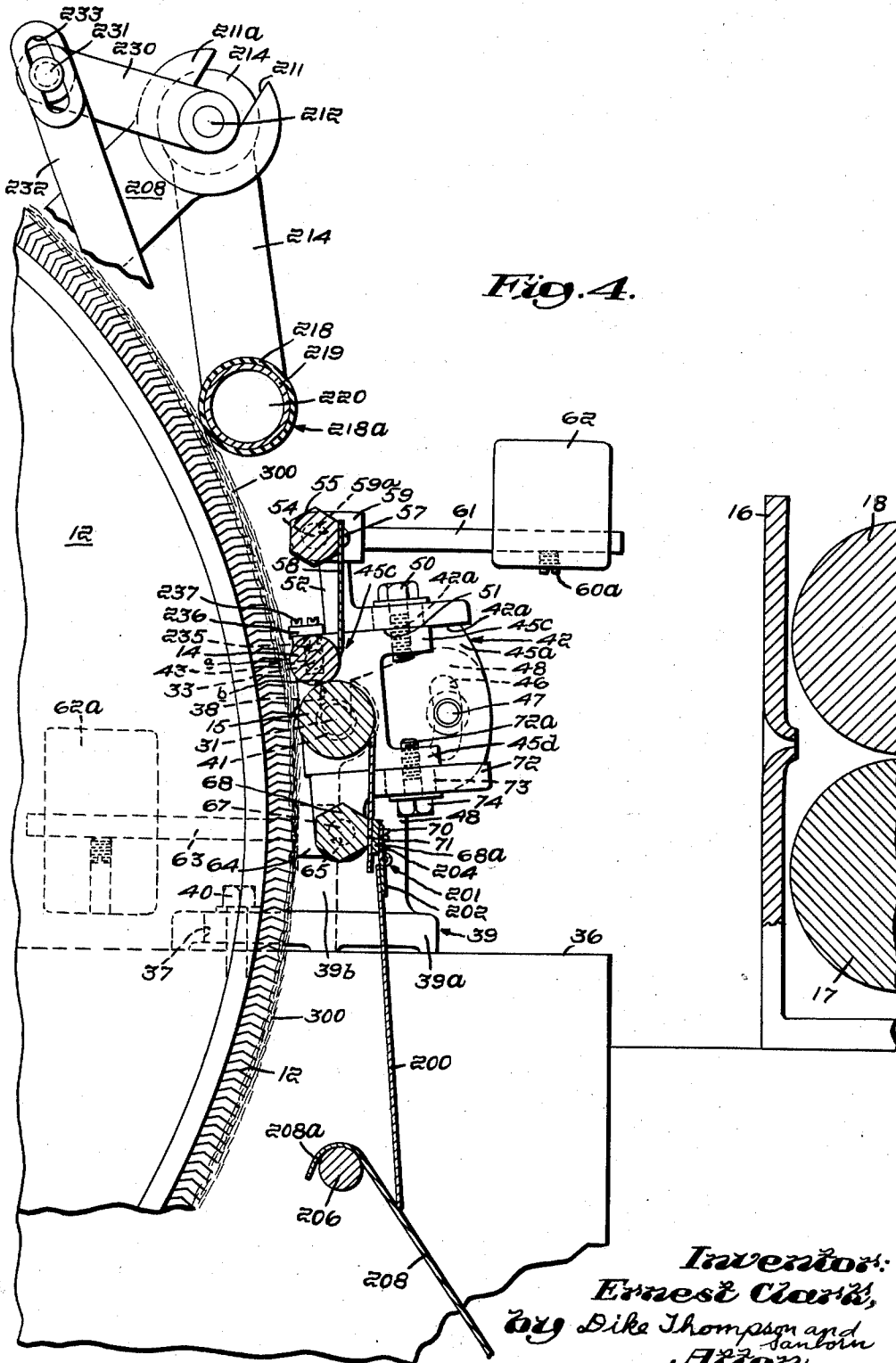
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CARDING APPARATUS AND METHOD

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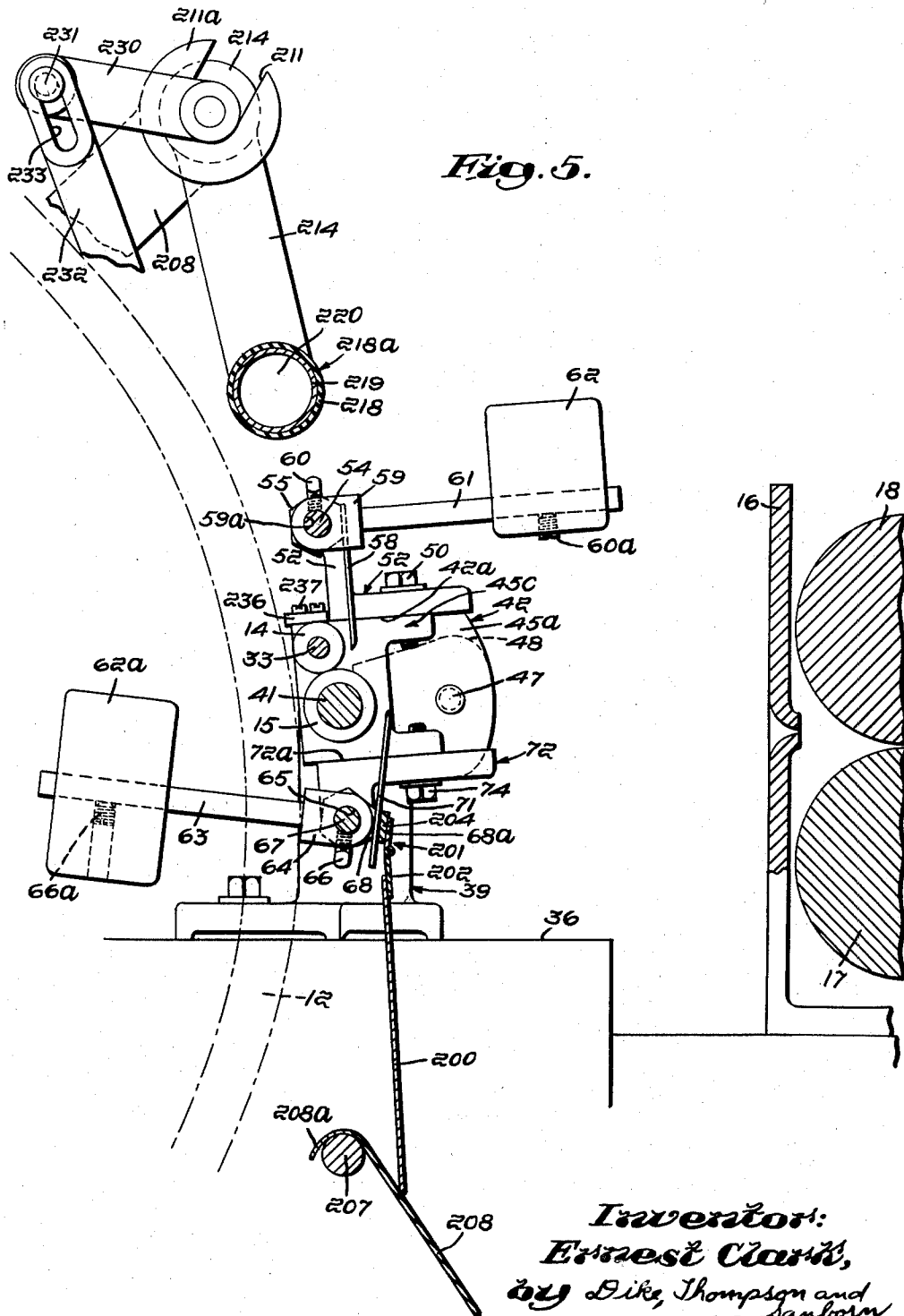
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CARDING APPARATUS AND METHOD

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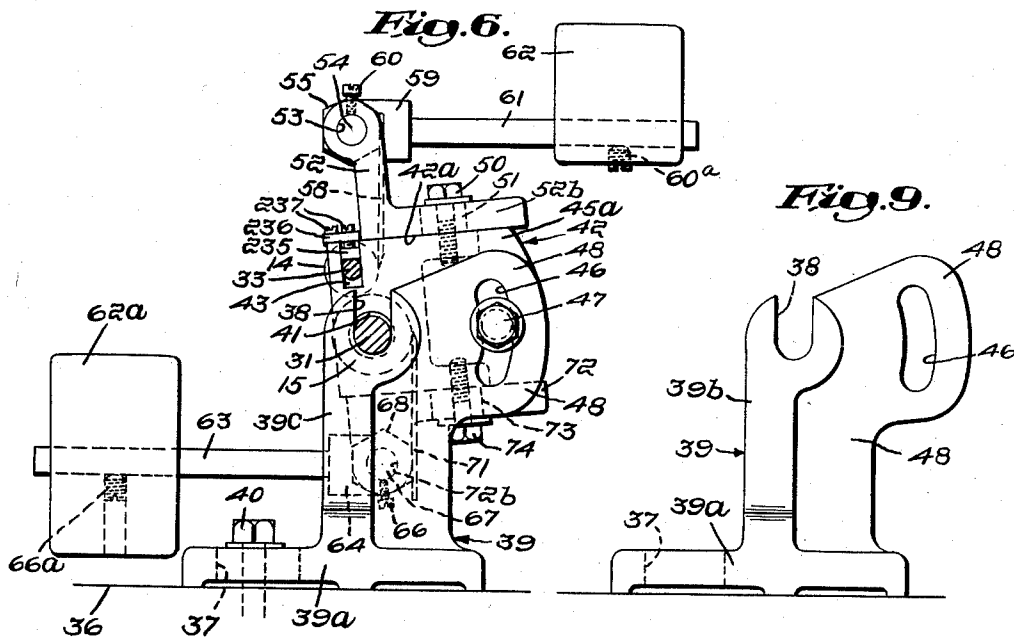
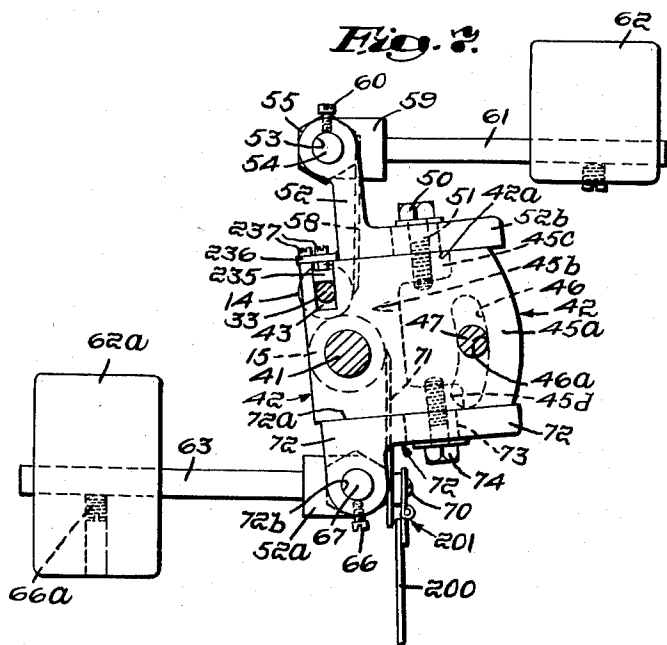
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CARDING APPARATUS AND METHOD

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7 Sheets-Sheet 6



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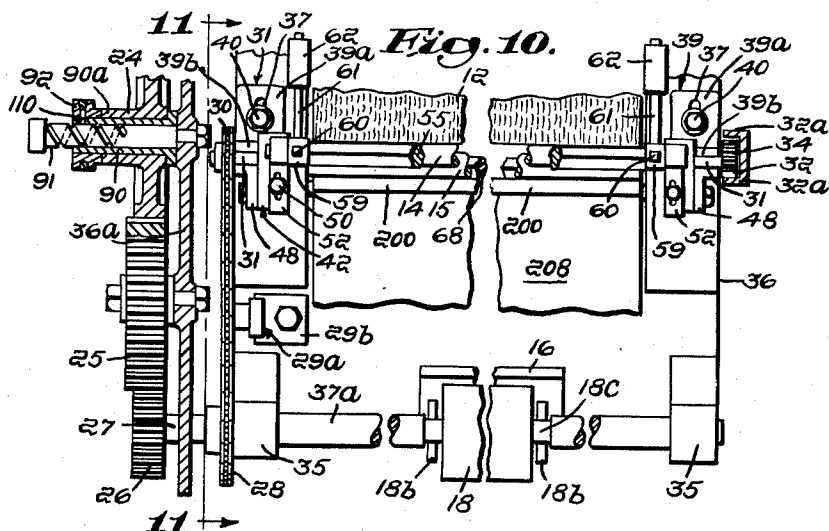
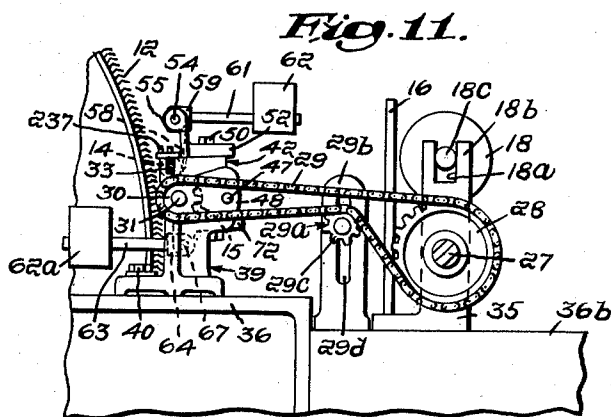
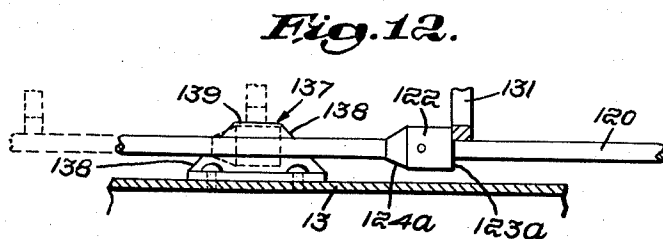
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CARDING APPARATUS AND METHOD

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2,910,735

CARDING APPARATUS AND METHOD

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Application July 16, 1956, Serial No. 598,182

23 Claims. (Cl. 19—106)

The present invention relates to carding machines and methods, especially carding machines and methods for carding cotton stock and more particularly to improvements of the carding machines and methods described in copending application Serial No. 513,547, which was filed June 6, 1955, by Ernest Clark and of which this application is a continuation-in-part.

In the copending application there is described a carding apparatus in which a pair of rotatable upper and lower rolls are used instead of a comb for rolling stock off the doffer cylinder in the form of a web. Prior to a stripping operation, the take off rolls are adapted to be deactuated and held stationary at the same time that the calender rolls and the feed rolls are deactuated and while the doffer cylinder and carding cylinder continue to rotate, whereupon the stationary rolls grip the web which was passing therethrough at the time they were deactuated and the continued rotation of the doffer cylinder breaks the web. The end fibers of the broken web are gripped by the stationary rolls and the rolls are of such a size and are so located with respect to each other and the doffer cylinder that the free ends of such gripped end fibers and the fibers entangled therewith are combed upwardly along the periphery of the rotating stock on the rotating doffer cylinder by contact with such rotating stock. Thereafter the doffer cylinder and the carding cylinder are stripped and the movement of the stripper toward the end of its path of travel automatically and simultaneously actuates the feeding mechanism and a timing mechanism, the latter of which simultaneously actuates the take off rolls and calender rolls after a predetermined time has elapsed from the time that it and the feeding mechanism are actuated. This predetermined time permits the doffer cylinder to become loaded with the proper thickness of freshly carded stock before the take off rolls are reactuated. Upon automatic reactivation of the take off and calender rolls by the timing mechanism, the take off rolls roll the freshly carded stock off the doffer cylinder together with the gripped end fibers of the broken web and the fibers entangled therewith, as a continuous web. It is believed that the broken web is automatically pieced together with the freshly carded stock on the doffer cylinder when the take off rolls are reactuated because the gripped end fibers of the broken web, together with the fibers entangled therewith, in being combed and whipped upwardly along the periphery of the freshly carded stock on the rotating doffer cylinder during loading of the doffer cylinder form a layer of fibers over the periphery of the freshly carded stock. This layer extends from the nip of the rolls to which it is anchored upwardly between the portion of the doffer cylinder which is closest to the upper roll and the portion of the upper roll which is closest to the doffer cylinder. Consequently, when the take off rolls are reactuated the layer of freshly carded stock and the layer of gripped end fibers are peeled off as a unit layer by the rolls.

A wiper is provided for each of the take off rolls to wipe off the waste material which collects thereon.

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Springs are used to urge the wiping edges of these wipers into wiping engagement with the rolls. It is necessary to periodically move the wipers out of wiping engagement with the rolls against the force of the springs in order to clean off the waste material which collects at the wiping edges. Unless this is done the waste material collecting on the wiper for the upper roll falls into the web and forms undesirable irregularities therein and the waste material collecting on the wiper for the lower roll falls to the floor and is apt to be blown onto the lower portion of the rotating doffer cylinder and form lumps in the stock which are apt to damage the rolls in passing therebetween and which cause irregularities in the final web. The waste material collecting on the lower roll wiper sometimes forms a continuous ribbon or felt which dangles from the lower wiper to the floor and which, if not removed, is apt to be blown onto the lower portion of the rotating doffer cylinder, thereby setting up movement of an endless web of material from the take off rolls around the lower wiper and lower roll back to the doffer cylinder. This web once produced gets thicker and thicker until damage results. Furthermore, unless the waste material is wiped off from the wiper periodically, it interferes with proper cleaning of the rolls so that such material continues around the rolls under the wiping edges of the wipers, thereby spoiling the web and sometimes damaging the take off rolls.

It is important that the wipers, which are in the form of thin resilient sheets of steel, are not urged against the rolls with too much force because this causes the sheets to bend, whereby the wiping edges which engage the surfaces of the rolls are bent outwardly, in which position they do not properly wipe the rolls. On the other hand, it is important that the wipers are urged against the rolls with sufficient force so that the waste material cannot pass between the wiping edges of the wipers and the roll surfaces. The pressure with which the wipers are urged against the rolls should not vary too much along the length of the wipers because too much biasing at one portion causes that portion to bend and too little biasing at another portion permits waste material to pass underneath such portion and continue around the rolls.

In the apparatus shown and described in the copending application, wherein springs are utilized to urge the wipers into wiping engagement with the rolls, whenever the wipers are cleaned they must be forced out of wiping engagement with the rolls against the force of the springs. Eventually this weakens the springs to such an extent that they do not urge the wipers against the rolls with adequate force and it is necessary to make certain adjustments to increase the force asserted by the springs. However, it is very difficult to adjust these springs by the proper amount. Usually they are either over-adjusted so that they exert too much force at particular portions along the length of the wipers or they are under-adjusted so they exert too little force.

It has already been stated that in the apparatus shown and described in the copending application, if waste material collecting on the lower roll wiper is not periodically cleaned off, it sometimes is blown onto the lower exposed portion of the rotating doffer cylinder below the take off rolls. In like manner, if there is a break in the web between the take off and calender rolls during carding operation, the draft produced by the rotating doffer cylinder is apt to cause the broken end of the web to be blown onto the doffer cylinder, thereby causing a continuous and endless web to be rolled through and under the take off rolls back to the doffer cylinder. This web continues to build up in thickness to a point where breakage is apt to occur.

It has also been found that during loading of the doffer cylinder after completion of a stripping operation and

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while the take off rolls are stationary and hold the broken ends of the old web, the surface fibers of the freshly loaded stock on the rotating doffer cylinder in contacting the gripped end fibers become entangled therewith and are pulled away from the remainder of the fibers on the surface of the stock. As more and more fibers on the gripped end fibers and the fibers already entangled therewith a long string of fibers is formed and dragged around the periphery of the stock on the doffer cylinder. Many of these strips or ribbons break off and continue around the doffer cylinder. Whether or not they break off, they show up as irregularities in the first portion of the web rolled off the doffer cylinder when the take off rolls are reactuated. Furthermore, the spaces left by the removal of the fibers from the periphery of the freshly loaded stock by contact with the string or ribbon causes further irregularities. This occurs primarily at increased doffer cylinder speeds when the thickness of the stock on the doffer cylinder and the thickness of the web finally produced and removed from the doffer cylinder, is increased.

It is desirable that the end fibers of the broken web which are not actually gripped by the rolls when they are deactuated but which are entangled with and held by such gripped end fibers at that time, remain so entangled and held along the width of the broken web so that a relatively full layer of fibers is held by the stationary rolls over the entire width of the periphery of the freshly loaded stock. In this way, when the take off rolls are reactuated, a good knit is obtained between the broken end of the old web and the new stock on the doffer cylinder along their entire widths. Although at increased doffer cylinder speeds, some of the fibers at certain portions along the width of the surface of the newly loaded stock on the doffer are caught by the anchored fibers and pulled off the periphery of the stock as aforesaid, others at other portions along the width of the surface of the stock catch the fibers which are entangled with and held by the gripped end fibers at the time the take off rolls are stopped, pull these already entangled fibers away from such gripped end fibers and carry them around the doffer cylinder, thereby reducing the fullness of the layer of fibers anchored between the stationary rolls and extending over the periphery of the freshly loaded stock and consequently detrimentally affecting the piecing together of the broken end of the old web and the stock on the doffer cylinder when the take off rolls are again reactuated.

It is an object of the present invention to provide a mechanism for urging the wipers into wiping engagement with the take off rolls with a fixed, predetermined pressure which is not affected by moving the wipers out of wiping engagement with the rolls against the force asserted by the urging mechanism in order to clean the wipers. A further object is to provide a wiping mechanism wherein the angle at which the wipers engage the peripheries of the take off rolls and the area of the take off rolls which are engaged by said wipers are adjustable. A further object is to provide novel supporting means for the take off rolls and the wipers so that the positions of the take off rolls are adjustable with respect to each other and with respect to the doffer cylinder and the position of the wipers are adjustable with respect to the take off rolls. Another object of the present invention is to provide a shielding mechanism for use with take off rolls of the type described above and which eliminates (1) the danger of the web being blown onto the doffer cylinder in the event that it breaks and (2) the danger of waste material removed by the wiping edge of the lower roll being blown onto the doffer cylinder. Yet another object of the present invention is to provide such a shielding mechanism in combination with a supporting means therefor and for the lower wiper, whereby the lower wiper can be moved out of engagement with the lower

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take off roll without interfering with the shielding mechanism. Still a further object is to provide a take off mechanism of the type described above wherein the formation of strings or ribbons around the periphery of the stock on the doffer cylinder while it is loading up after a stripping operation and while the take off rolls are stationary and hold the broken end of the old web, is reduced. A further object is to provide such a take off mechanism wherein the number of fibers pulled off the periphery of the freshly loaded doffer cylinder by the gripped end fibers and the number of entangled fibers pulled away from said gripped fibers by the fibers on the periphery of the stock while the doffer cylinder is being loaded after a stripping operation and the take off rolls are deactuated, is reduced. Still another object is to provide a mechanism for ironing and compacting the stock on the doffer cylinder at least during the time that the doffer cylinder is loading up after a stripping operation and while the take off rolls are deactuated. Another object is to provide such an ironing and compacting mechanism which is actuated at the same time the feed roll and take off rolls are deactuated preparatory to a stripping operation and which is automatically deactuated simultaneously with the reactivation of the take off rolls within a predetermined period of time after the feed roll is automatically reactuated by the traverse of the stripper during a stripping operation so that the compacting and ironing mechanism is operable only while the take off rolls are deactuated. Still another object is to provide an improved carding apparatus and method and an improved take off mechanism for a carding apparatus. Other objects will be apparent from the consideration of the following description and the accompanying drawings.

Fig. 1 is a right side elevation of a portion of a carding machine embodying the present invention;

Fig. 2 is a front elevation of the apparatus of Fig. 1, the position of the stripper and control mechanism at the commencement of a stripping operation, when the feed roll, calender rolls and take off rolls are deactuated and the compacting and ironing roll is actuated, being shown in full lines and the position thereof at the completion of the stripping operation, when the feed roll and the ironing and compacting roll are actuated but the calender rolls and take off rolls are stationary and the doffer cylinder is being loaded with freshly carded stock, being shown in dotted lines;

Fig. 3 is an enlarged front elevation of the take off rolls, take off roll wipers, bracket assemblies, the ironing and compacting roll and the shield for protecting the doffer cylinder;

Fig. 4 is a section taken along the line 4—4 of Fig. 3;

Fig. 5 is a view similar to Fig. 4 but taken along the line 5—5 of Fig. 3 showing the compacting roll out of engagement with the doffer cylinder and the wipers out of engagement with the take off rolls. The compacting and ironing roll is in this position during carding operation while the take off rolls are actuated. The wipers are moved to this position when they are wiped;

Fig. 6 is a view taken along the line 6—6 of Fig. 3;

Fig. 7 is a section taken along the line 7—7 of Fig. 3 with the background behind the bracket for the upper roll and the brackets for the wipers being eliminated except for the wipers and the weighted arms for urging the wipers into engagement with the rolls;

Fig. 8 is a view taken along the line 8—8 of Fig. 3 showing the upper roll bracket and wiper brackets from the side opposite that shown in Fig. 7 and with background eliminated;

Fig. 9 is a side view of the lower roll bracket;

Fig. 10 is a top plan view partially in section of the front part of the apparatus of Fig. 1 but with the take off and calender rolls in operation;

Fig. 11 is a section taken along the line 11—11 of Fig. 10;

Fig. 12 is an enlarged front elevation of the control rod which is moved by the stripper during a stripping operation, the latch of the stripper for moving the rod and the guide means for disengaging the latch from the rod.

The drawings show an embodiment of the present invention applied to the carding machine described and shown in copending application Serial No. 513,547. The carding machine comprises a conventional feeding mechanism including a conventional feed roll (not shown), followed by a conventional lickerin (not shown) followed by a conventional card cylinder 10 (Fig. 1) followed by a conventional doffer cylinder 12 having a doffer cylinder cover 13 with side walls 118. Two take off rolls 14 and 15 are provided for taking the carded stock off the doffer cylinder 12. Rolls 14 and 15 are followed by a conventional trumpet 16 which is followed by two conventional calender rolls 17 and 18 from which the sliver passes in a conventional manner into a conventional sliver can (not shown). The doffer cylinder 12 is driven through gears and belts from the lickerin. The lickerin is in turn driven from the card cylinder 10 by a belt (not shown) and the card cylinder 10 is in turn driven by a motor (not shown) or other driving means, all of which are conventional. The doffer shaft 19 acting through miter gears 20 and 21, drives the feed shaft 22, which, through conventional beveled gears (not shown) drives the feed roll (not shown) in a conventional manner. The doffer gear 23 (Fig. 2) of doffer 12 drives calender roll gear 26 through a disengaging gear 24 (rotatably mounted on bushing 90 which is mounted on threaded shaft 91, which is in turn mounted on frame 36a) and an idler gear 25 (rotatably mounted on frame 36a). Calender roll gear 26, in turn, acts through a shaft 27 (Figs. 10 and 11), sprocket gear 28, chain drive 29 and chain tightener 29a (mounted on a bracket 29b and comprising an idler sprocket 29c adapted to be moved to and fixed in different positions along slot 29d of bracket 29b), to drive a sprocket 30 (Figs. 2, 3, 10 and 11) attached to one end 31 of the lower take off roll 15 whereby such lower take off roll is rotated. The other end 31 (Fig. 3) of roll 15 is provided with a gear 32 which drives upper roll 14 through gear 34 which is attached to one end 33 of upper roll 14. Gears 32 and 34 are housed in housing 32a. Calender roll shaft 27 (Figs. 10 and 11) is rotatably supported at its ends in brackets 35 on frame 36b, drives calender roll 17 and is provided with a conventional protective tube 37a (Fig. 10). Upper calender roll 18 (Figs. 10 and 11) is rotatably supported by the ends of shaft 18c in the slots 18a of brackets 18b which are attached to frame 36b. It is driven by its own weight resting on rotating lower calender roll 17.

The end portions 31 of lower take off roll 15 are supported in the slots 38 (Figs. 4, 6 and 9) of a pair of slotted lower roll brackets 39 (see Figs. 1 to 11, especially Figs. 3, 6 and 9) each of which is adjustably attached to main frame 36 by means of slot 37 in a foot 39a of each bracket 39 and bolt 40 so that the lower roll 15 can be moved away from and toward the doffer cylinder 12. The slot 38 (Figs. 6 and 9) of each bracket 39 is located in the top of a thick column 39b extending upwardly from the foot 39a. A thinner relatively flat wing portion 48 extends rearwardly of the thick column 39b and upwardly from foot 39a and has a curved slot 46.

The end portions 31 of roll 15 extend inwardly into portions 41 (Fig. 3), which are of greater diameter than portions 31 and on which are rotatably mounted, by means of apertures 33a (Fig. 3) a pair of slotted top roll brackets 42, in the slots 43 (Figs. 1, 3, 4 and 6 to 8) of which are supported the ends 33 of top roll 14. End portions 33 of roll 14 are of lesser diameter than the remainder of roll 14 and form with the remainder of roll 14 shoulders 45 (Fig. 3) which prevent longitudinal

movement of top roll 14 with respect to top roll supporting brackets 42.

Each upper roll bracket 42 is comprised of a U-shaped portion 45b (see Figs. 3, 7 and 8), the legs 45c and 45d of which extend rearwardly away from the doffer cylinder, and a flat portion 45a, which is integral with one side of portion 45b and extends rearwardly beyond the ends of legs 45c and 45d to form a rearwardly extending wing. Slot 43 runs across the entire thickness of the bracket 42 along the top of the portions 45a and 45b. The rearwardly extending wing of portion 45a of each bracket 42 is provided with a threaded aperture 46a (Figs. 7 and 8) which together with bolt 47, which passes through slot 46 of wing portion 48 of bracket 39 and which screws into such threaded aperture 46a, permits top brackets 42 to be rotated or swung on portions 41 of lower roll 15 to adjust the position of roll 14 away from doffer 12 and around lower roll 15 and to be locked in such position.

Adjustably supported on the top edges 42a of brackets 42 by means of bolts 50 and slots 51 are a pair of angular shaped upper wiper support brackets 52 (see Figs. 3 and 8) having apertures 53 in which are rotatably supported the circular reduced diameter ends 54 of an upper hexagonal rod 55 having adjustably mounted thereon by means of slots 56 and screws 57 (Fig. 3) an upper roll wiper 58 which comprises a rectangular thin piece of flexible metal. The lower edge of wiper 58 is resiliently urged against the top roll 14 by means of upper tension members 59 which are mounted rigidly and adjustably on the reduced diameter ends 54 of upper hexagonal rod 55 inwardly of upper wiper supporting brackets 52 by means of apertures 59a and set screws 60 (Fig. 3) and which have arms 61 (Figs. 3 to 8) to the ends of which are adjustably attached by means of holding screws 62a, weights 62.

Adjustably mounted on the bottom edges 72a of brackets 42 by means of bolts 74 and slots 73 are a pair of angular shaped lower wiper support brackets 72 having apertures 72b in which are rotatably supported the circular reduced diameter ends 67 of a lower hexagonal rod 68 having adjustably mounted thereon by means of slots 69 and bolts 70 (Fig. 3) a lower roll wiper 71 similar in construction to upper wiper 58 and the upper edge of which wipes the lower roll 15. The upper edge is resiliently urged into wiping engagement with lower roll 15 by means of a pair of lower tension members 64, which are mounted rigidly and adjustably on the reduced diameter ends 67 of lower hexagonal rod 68 inwardly of lower wiper supporting brackets 72 by means of apertures 65 (see Figs. 3 and 5) and set screws 66 (Fig. 3) and each of the lower tension members 64 have an arm 63 to the end of which is adjustably attached by means of a holding screw 66a, a weight 62a.

It is apparent that by means of slots 56 and 69 (Fig. 3) and bolts 57 and 70 and by means of set screws 60 and 66 the location of the wipers 58 and 71 with respect to rolls 14 and 15 can be adjusted so that the wiping edges of such wipers contact different areas of the rolls at different angles. The force asserted by such edges at any particular angle can be adjusted by adjusting the position of the weights 62 and 62a on the arms 61 and 63. Further adjustment of the wiping edges of the wipers 58 and 71 away from and toward their respective rolls is made possible by slots 51 and 73 in upper and lower wiper supporting brackets 52 and 72 respectively and bolts 50 and 74. Preferably the wiping edge of wiper 58 is above the axis of rotation of the upper roll and the wiping edge of the wiper 71 is below the axis of rotation of the lower roll.

Enlarged portions 41 (Figs. 3 to 8) of roll 15 extend inwardly into the roll 15 proper which is of greater diameter than portions 41 and which form therewith shoulders 80 (Fig. 3), which abut against the inner edges of upper roll brackets 42 to prevent longitudinal movement of low-

er roll 15. Lower roll brackets 39 prevent longitudinal movement of brackets 42.

The upper portion of a shield 200 (Figs. 2, 3 to 5 and 7), comprising a flat piece of sheet metal, is hingedly attached to the lower hexagonal rod 68 by means of a plurality of hinges 201 which are screwed to the hexagonal rod 68 by some of the same screws 70 which attach the lower wiper 71 to the rod 68. A flat strip 68a of metal lies between the upper portion 204 of hinges 201 and a flat side of the hexagonal rod 68, the bolts 70 also passing through apertures in strip 68a. The lower edge of shield member 200 rests on the forward slope of doffer cylinder pan 208 which is supported on rod 206 by a bent over portion 208a. The ends 207 of rod 206 are supported in the frame of the carding machine.

The shield member 200 and wiper 71 form a barrier between the doffer cylinder 12 and the web passing from the take off rolls 14 and 15 to calender rolls 17 and 18 so that such web cannot be blown on or against the rotating doffer cylinder in the event it breaks. Furthermore, the wiper 71 and shielding member 200 prevent any waste material collecting at the wiping edge of the lower wiper 71 from being blown against the rotating doffer cylinder.

It will be apparent from Figs. 4 and 5 that the wipers 58 and 71 can be moved out of contact with the rolls 14 and 15 from the position shown in Fig. 4 to the position shown in Fig. 5 so that the wipers can be wiped clean by merely lifting the weights 62 and 62a thereby rotating the rod 55 counterclockwise and rod 68 clockwise so that the wiping edges of wipers 58 and 71 are moved out of engagement with the rolls as shown in Fig. 5. The hinged joint between lower hexagonal rod 68 and shield member 200 permits this movement of lower wiper 71 without bending the shield member 200. If the hinged connection were omitted, lifting of weights 62a would cause the lower portion of shield 200 to be forced against the pan 208 thereby bending the shield member 200 and placing a strain on the entire wiper assembly.

The weights 62a are heavier than weights 62 to compensate for the weight of the shield member 200, which exerts a force tending to move wiper 71 out of engagement with roll 15.

A rod 212 (Figs. 1 to 5) spanning the width of the doffer cylinder is rotatably supported by means of bushings 213 (Fig. 3) in slots 211 in the top portion 211a of a pair of conventional grinder or burnishing brackets 208, which are adjustably attached to the sides 118 of doffer cylinder cover 13 by means of slots 209 and bolts 210 (Figs. 1 and 2).

The ends of a pair of arms 214 are rigidly attached to rod 212 by means of set screws 216 (Fig. 3). Rotatably mounted in apertures 221 (Fig. 3) in the other ends of arms 214 by means of ball bearings 222 and steel end plugs 220 is an ironing and compacting roller 218a comprising a steel tube 218 having on its outer surface a rubber cot or tube 219, preferably of neoprene rubber which is static free, impervious to oil and of fairly soft quality. The bearing plugs 220 have reduced diameters to fit the ball bearings 222 and aperture 221 and are inserted in the ends of the steel tube 218. The ball bearing fitting makes roll 218a freely rotatable in the ends of arms 214. When roll 218a is resting by its own weight as shown in Fig. 4 on stock 300, which is located on and rotating with the periphery of doffer cylinder 12, it irons and compacts the stock, the weight of the roll 218a being sufficient to provide such an ironing and compacting effect. The engagement of the periphery of roll 218a with the rotating stock causes it to rotate in its bearings 222.

By loosening or removing set screw 216 (Fig. 3), arms 214 are freely swingable about rod 212 and consequently the roll 218a, which is suspended from such arms, rests on the doffer cylinder or the stock carried thereby at all times.

By rigidly attaching arms 214 to rod 212 by tightening

set screws 216, roll 218a is adapted to be lifted out of contact with the doffer cylinder to the position shown in Fig. 5 by means of an arm 230, one end of which is rigidly attached to the end of rod 212 by means of set screw 230b and the other end of which is pivotally and slidably connected by means of bolt 231 and slot 233 with one end of an arm 232. The other end of arm 232 is pivotally connected at 233a (see Figs. 1 and 2) with an arm 234. One end of arm 234 is rigidly attached to rotatable rod 107 which is connected with a control mechanism as hereafter described and the other end carries a weight 106a. When the roll 218a is in contact with stock 300 as shown in Fig. 4, the slot 233 and bolt 231 are in the position shown in Fig. 4 with bolt 231 intermediate the ends of the slot so that roll 218a rests on the stock primarily by its own weight (plus a relatively insignificant portion of the weight of arms 214). Counterclockwise rotation of rod 107 (Fig. 1) moves arm 232 longitudinally downwardly until the upper edge of the slot 233 contacts the bolt 231, whereafter further rotation of rod 107 and hence further longitudinal movement of arm 232 causes arm 230 and hence rod 212 to move in a counterclockwise direction, whereby the roll 218a is moved upwardly out of engagement with the stock 300 to the position shown in Fig. 5. Thereafter, when the rod 107 is rotated in an opposite direction, arm 232 is moved upwardly until roll 218a drops onto the stock 300 by virtue of its own weight, whereafter further rotation of rod 107 moves arm 232 to the position shown in Fig. 4 in which position only the force of the weight of roll 218a is applied to the stock to iron and compact the same.

Rod 107 is connected to the control mechanism 94 and gear 24 (see Figs. 2 and 10) in the manner described and shown in the copending application.

Referring to Figs. 1, 2 and 3, rotation of handle 95 of control mechanism 94 from the position shown in dotted lines in Fig. 2, which is the position it occupies during normal carding operation, to the position shown in full lines, moves gear 21 laterally away from and out of engagement with gear 20 by means of an eccentric bush on shaft 22 (not shown but shown and described in the copending application) whereby the feed mechanism of the carding machine is deactivated. The same movement of handle 95 rotates pulley 99 through a one way clutch mechanism (not shown), which, through flexible strip or chain 100, rotates pulley 101, which, through a one way clutch mechanism (not shown but described in the copending application) rotates pulley 104, which, through chain pull 105, rotates arm 106, shaft 107, arm 234 and pulley 103 in a clockwise direction (Fig. 1) against the force of weight 106a. This rotation of pulley 103 moves gear 24 out of engagement with gear 23 (Fig. 2) through movement of cable 109, which rotates bushing 92, which through set screw 110 rotates bushing 90, which, through pin 90a, moves gear 24 to the left from the position shown in Fig. 10 to the position shown in Fig. 2, whereby rotation of rolls 14 and 15 and calender rolls 17 and 18 is deactivated. The clockwise rotation of 107 against the force of weight 106a moves arm 232 upwardly to the position shown in Fig. 4, whereby roll 218a moves downwardly onto the stock 300 on the doffer cylinder 12 and rests thereon by its own weight as shown in Fig. 4. A locking mechanism actuated by the same movement of handle 95 locks pulley 99 and hence rod 107, gear 24 and roll 218a into the positions to which they are moved by the above mentioned rotation of handle 95, against the force of weight 106a. This locking mechanism is part of the timing mechanism 170 which is described fully in the copending application. The same rotational movement of handle 95 also moves arms 113, 114 and 115 and rod 120 from the positions shown in dotted lines in Fig. 2 to the positions shown in full lines.

Rotation of the handle 95 in an opposite direction from the position shown in full lines to the position shown

in dotted lines (Fig. 2) either by hand or by moving rod 120 from the position shown in full lines to the position shown in dotted lines causes gear 21 to move into engagement with gear 20 whereby the feed is again actuated. The same movement also actuates timing mechanism 170 (Fig. 1), which, after a predetermined time, automatically releases the lock mechanism holding pulley 99 and hence gear 24 and roll 218a against the force of weight 106a in the position to which they were previously rotated by movement of handle 95 to the position shown in full lines, whereupon the weight 106a rotates rod 107 in a counterclockwise direction whereby (1) gear 24 is moved into driving engagement with gears 23 and 25 through bushings 90 and 92, pins 90a and 110, cable 109 and pulley 108 and take off rolls 14 and 15 and calender rolls 17 and 18 are reactivated and commence to roll stock off the doffer cylinder 12 and (2) roll 218a is moved upwardly out of engagement with stock 300 from the position shown in Fig. 4 to the position shown in Fig. 5 through arms 214, 230, 232 and 234.

Assuming that the carding machine shown in the drawings is in carding operation with gear 21 in driving engagement with gear 20, gear 23 in driving engagement with gear 24 and roll 218a lifted out of engagement with the doffer cylinder all by virtue of the force asserted by weight 106a and it is desired to carry out a stripping operation, the handle 95 is manually thrown outwardly from the position shown in dotted lines in Fig. 2, where it is normally located during carding operation, to the position shown in full lines in Fig. 2, to cause link 114, arm 115 and rod 120 to move from the position shown in dotted lines in Fig. 2, where they are normally located during carding operation, to the position shown in full lines. This rotation of arm 95 also causes miter gear 21 to move away from and to become disconnected from miter gear 20, thereby deactuating the feed rolls. At the same time, pulley 99 is rotated against the pull of counterweight 106a thereby causing rotation of pulleys 101 and 104 against the pull of weight 106a. This rotation of pulleys 101 and 104 operates the chain pull 105, which, through arm 106, shaft 107, pulley 108, chain 109 and bushing 92 and against the pull of weight 106a, moves bushing 90 axially outwardly whereby gear 24 is moved out of driving engagement with gear 23 and calender rolls 17 and 18 and take off rolls 14 and 15 stop rotating. The train of gearing between gear 24 and take off and calender rolls 14 and 15 and 17 and 18 asserts a sufficient amount of friction to hold these rolls against rotation while gear 24 is disengaged and doffer cylinder 12 continues to rotate. This same rotation of pulleys 99, 101 and 104 against the pull of weight 106a, operates through chain pull 105, arm 106, shaft 107, arm 234 and against the pull of weight 106a to move arm 232 and slot 233 upwardly from the position shown in Fig. 5 to the position shown in Fig. 4, whereupon roll 218a drops by its own weight from the position shown in Fig. 5 to the position shown in Fig. 4 onto the stock on the doffer cylinder 12 and the weight thereof compacts and irons such stock. Pulley 99, chain 100, pulleys 101 and 104, arm 106, shaft 107, pulley 108, chain 109, bushings 92 and 90, arms 234, 232, 230 and 214 and roll 218a are all automatically locked in these positions by the same movement of handle 95 and pulley 99 until they are released, as described hereafter.

At this stage, with the various parts of the apparatus in the position shown in full lines in Fig. 2, with calender rolls 17 and 18, take off rolls 14 and 15 and the feed roll stationary and with roll 218a in the position shown in Fig. 4 resting on the stock 300 of the doffer cylinder 12 but with the doffer cylinder and carding cylinder continuing to rotate, the carding machine is in condition for a stripping operation.

The stripping operation is initiated by manually moving stripper 125 along stripper support 123b from the position shown in dotted lines in Fig. 2 where it came to rest during a preceding stripping operation and where it is

normally positioned during operation of the card, to the position shown in full lines in Fig. 2. While doing this, the driving connection of the stripper is held out of driving engagement with the stripper driving mechanism 123 as described in the copending application. During movement of stripper 125 as aforesaid, the latch 131 (Fig. 12) reciprocally carried by the stripper as described in the copending application rides along rod 120 (see Figs. 2 and 13) up one sloped surface 138 of guide 137, along surface 139, down the other sloped surface 138, along rod 120, up the sloped surface 124a of block 122, such block being in the position shown in full lines in Fig. 2 where it was moved by throwing out handle 95 as aforesaid, along the top of block 122 down to rod 120 and thence along 120. After the stripper is moved to the position shown in full lines in Fig. 2, the driving connection thereof is placed in driving engagement with the feed mechanism 123 and stripper 125 is driven toward the position shown in dotted lines in Fig. 2 and strips the doffer and card cylinders. Meanwhile, the take off rolls and calender rolls as well as the feed roll remain stationary and the roll 218a is in the position shown in Fig. 4. As stripper 125 moves from the position shown in full lines in Fig. 2 toward the position shown in dotted lines, latch 131 first slides along rod 120 until it contacts shoulder 123a of block 122 as aforesaid.

Thereafter, further movement of stripper 125 causes latch 131 to move rod 120 from the position shown in full lines in Fig. 2 to the position shown in dotted lines in Fig. 2, whereafter latch 131 rides over the guide 137 out of contact with block 122 as shown in dotted lines in Fig. 12 and rod 120 is moved no further. The stripper and latch 131 continue to move to the end of their traverse to the position shown in dotted lines in Figs. 2 and 12 during which time latch 131 rides along rod 120. The above mentioned automatic movement of rod 120 from the full line position shown in Fig. 2 to the dotted line position causes rotation of handle 95 through arm 115, link 114 and crank 113 from the position shown in full lines in Fig. 2 to the position shown in dotted lines and causes shaft 22 to move laterally toward the carding machine until miter gear 21 meshes with gear 20, thereby simultaneously actuating the feed roll and the timing mechanism 170, which timing mechanism, when sufficient time has elapsed after the feed roll has been actuated to produce a satisfactory build up of card stock on the doffer cylinder, automatically releases the lock up mechanism which is holding gear 24 out of driving engagement with gear 23 and roll 218a in the position shown in Fig. 4 against the force exerted by weight 106a, whereupon the weight 106a rotates rod 107 counterclockwise (Fig. 1) which (1) causes gear 24 to move into driving engagement with gear 23 whereby the take off rolls 14 and 15 and the calender rolls 17 and 18 are actuated and (2) causes roll 218a to move from the position shown in Fig. 4 to the position shown in Fig. 5.

The particular timing mechanism 170 and locking mechanism included therein and the particular control mechanism 94 including pulley 99 and handle 95 and the particular construction of stripper 125 including the manner in which latch 131 is attached thereto are all exactly as described in the copending application and they operate in the same manner. Consequently the structure thereof is not shown or described herein. Furthermore, the linkage between rod 120 and the control mechanism 94 and the linkage between pulley 99 and arm 106 is exactly like that shown and described in the copending application.

The surface speeds of rolls 14 and 15 in relation to doffer cylinder 12 and the surface speeds of the calender rolls, the sizes of the take off rolls, the material from which the take off rolls are made and the distances of each of such rolls with relation to each other and with relation to the doffer cylinder are all the same as in the copending application.

The diameter of the upper roll 14 should be such that with the use of a lower roll 15 and doffer cylinder of any particular size, the circumferential distance between the portion *a* (Fig. 4) of such upper roll which is closest to the doffer cylinder and the portion *b* of such upper roll which is closest to the bottom roll is less than about 0.875 inch, which, in the case of cotton carding, is approximately the shortest length of fibers which pass in substantial numbers through the carding machine and into the web removed from the doffer cylinder. However, an upper roll having a diameter wherein such circumferential distance is less than about 0.7735 inch is the preferred embodiment.

During normal operation of the take off rolls 14 and 15 the web being removed from the doffer cylinder is continuous with the carded stock on the doffer cylinder. After the feed roll, take off rolls and calender rolls are stopped and held stationary by throwing out handle 95, the continued rotation of the doffer breaks the web and the carded stock 300 on the doffer cylinder continues to rotate with the doffer cylinder. The web breaks because the fibers on the doffer cylinder, as it rotates, pull away from the fibers gripped and held stationary by the bite of the take off rolls. These gripped fibers comprise the end fibers of the broken end of the web and the free ends thereof or other fibers entwined therewith are dragged upwardly by the rotating periphery of stock on the doffer cylinder to an area on such periphery opposite to and slightly beyond the portion *a* of upper roll 14 which is closest to the doffer cylinder. These end or entwined fibers form a layer of fibers along a portion of the periphery of the carded stock which is held by the stationary rolls and which extends between *a* of the upper roll and the periphery of the stock in the doffer cylinder. In other words, the continued rotation of the doffer causes the carded stock 300 thereon to provide a combing effect upon the end or entwined fibers held by the two take off rolls causing them to be pulled upwardly around a portion of the periphery of the carded stock and to be maintained in such position.

The pressure of roll 218*a* which drops onto the stock on doffer cylinder 12 at the same time that the take off rolls are deactuated irons and compacts the stock on the doffer cylinder when it passes under the roll.

After the stripping operation, the clean doffer continues to comb the fibers held by the take off rolls and hold them in substantially the same position.

After the feed roll is reactivated, as aforesaid, by engagement of miter gears 20 and 21 but before the take off rolls are actuated by the timing mechanism, card stock builds up on the surface of the doffer cylinder and contacts the end fibers which are held by the take off rolls in the same manner as the old stock. The pressure of roll 218*a* irons and compacts the new stock on the doffer cylinder thereby flattening out the surface fibers thereof rendering such surface harder and smoother and decreasing the thickness of the stock. It is believed that by flattening the surface fibers and rendering the surface harder and smoother there are less loosely held fibers extending outwardly from the periphery of the stock. Consequently, less fibers on the surface of the stock become entwined with the fiber ends gripped by the take off rolls or with the fibers already entwined therewith, and hence less fibers are pulled away from the remainder of the stock by such gripped end fibers or pull fibers already entwined with the gripped fibers away from such gripped fibers and the formation and breaking off of long ribbons or strips of fibers around the periphery of the stock and the defects which such broken off ribbons or strings cause in the initial web rolled off the doffer when the take off rolls are reactivated are prevented. By reducing the thickness of the stock the periphery thereof is not so close to the ends of the gripped fibers or the fibers already entwined therewith and hence does not contact such fibers so intimately. Consequently, the amount of entwining,

the formation of ribbons or strings, the breaking off of such strings and the tendency of the moving periphery of the stock to pull the gripped end fibers out of the nip of the take off rolls and to pull fibers already entwined with such end fibers away from such end fibers is reduced.

When the take off rolls are actuated by the timing mechanism, the initial rotation of the upper roll causes the free ends of the end or entwined fibers which are gripped between the upper and lower rolls and which form a layer on the periphery of the fresh stock, together with the fresh carded stock which is contacting the fibers at that time to be peeled off as a single web which passes between the upper and lower rolls and continues on to the calender rolls. The fact that the ends of the fibers held by the take off rolls are peeled off together as a layer with the carded stock causes them to intermingle and form a continuous bond.

The reason for lifting the roll 218*a* off from the doffer cylinder at the time rolls 14 and 15 are actuated and during carding is to reduce the danger of damaging the wires of the doffer cylinder by continued pressure exerted thereon by the roll. However, the chance of damaging the wires is so slight that 218*a* can rest on the doffer cylinder at all times during carding and stripping without any substantial danger. This can be done by loosening holding screw 216 (Fig. 3) so that rotation of rod 212 has no effect on roll 218*a* and consequently the roll rests on the doffer cylinder at all times by its own weight so that there is an ironing and compacting of the stock on the doffer cylinder even during carding. This does not have any harmful effect on the carding operation. If it is desired to operate the roll 218*a* in this manner, arms 230 and 232 can be omitted altogether.

Although certain theoretical explanations have been advanced herein it is not intended that the invention be in any way limited thereto or thereby.

It will be understood that the particular mechanism shown and described herein for performing the method and accomplishing the purpose of the present invention is of an illustrative character and not restrictive of the meaning and scope of the following claims.

I claim:

1. In a carding apparatus comprising a doffer cylinder, the improvement comprising a pair of take off rolls for rolling a web of textile fibers off said doffer cylinder in the form of a web, first take off roll bracket means for rotatably and adjustably supporting one of said rolls for adjustment toward and away from the doffer, second take off roll bracket means rotatably and adjustably supported on said first bracket means, for rotatably and adjustably supporting the other of said rolls for adjustment around the first roll and toward and away from the doffer, a wiper for each of said rolls, wiper bracket means adjustably supported on said second take off roll bracket means, for adjustably supporting one of said wipers for movement thereof into and out of wiping engagement with one of said rolls, means associated with said one wiper for urging the same into wiping engagement with said one take off roll.

2. In an apparatus comprising a doffer cylinder, the improvement comprising a pair of take off rolls for rolling stock off said doffer cylinder in the form of a web, means for adjustably supporting one of said rolls so that the distance thereof from the doffer cylinder is adjustable, means for adjustably supporting the other of said rolls on said means for supporting said one roll so that the distance of said other roll from said doffer cylinder and around said one roll is adjustable, a wiper for wiping each of said rolls, means for adjustably supporting at least one of said wipers, said last mentioned means including means for adjusting the angle between said wiper and its roll and the area of said roll which is engaged by said wiper.

3. In a carding apparatus comprising a doffer cylinder, the improvement comprising a pair of take off rolls for rolling stock of said doffer cylinder in the form of a

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web, first take off roll bracket means for adjustably and rotatably supporting one of said rolls at an adjustable distance from said doffer cylinder, second take off roll bracket means for rotatably and adjustably supporting the other of said rolls at an adjustable distance from said doffer cylinder and around said first roll, a wiper for each of said rolls, first wiper bracket means adjustably supported on said second take off roll bracket means, for rotatably and adjustably supporting a first wiper shaft, means for adjustably attaching one of said wipers to said first wiper shaft so that rotation of said shaft in one direction moves a wiping edge of said wiper into engagement with one of said rolls and rotation of said shaft in the other direction moves said wiping edge out of engagement with said one roll, second wiper bracket means adjustably supported on said second take off roll bracket means, for rotatably and adjustably supporting a second wiper shaft, means for adjustably attaching the other wiper to said second wiper shaft so that rotation of said second shaft in one direction moves a wiping edge of said other wiper into engagement with the other of said rolls and rotation of said second shaft in the other direction moves said wiping edge out of engagement with said other roll, means for urging said first wiper shaft to rotate in said one direction to urge the wiping edge of said one wiper against the periphery of said one roll, means for urging the second wiper shaft to rotate in said one direction to urge the wiping edge of said other wiper against the periphery of the other roll, said means for urging said first wiper shaft to rotate in said one direction to urge said one wiper into wiping engagement with said one roll comprising arm means extending radially from and adjustably attached to said first wiper shaft and having a weight attached thereto, and said means for urging said second wiper shaft to rotate in said one direction to urge said other wiper against said other roll comprising arm means adjustably attached to and extending radially from said second shaft and having a weight attached thereto.

4. In a carding apparatus comprising a doffer cylinder, the improvement comprising a pair of rolls for rolling stock off said doffer cylinder in the form of a web, said pair of rolls comprising an upper roll and a lower roll, a lower roll wiper for wiping the lower roll, an upper roll wiper for wiping the upper roll, wiper bracket means for rotatably and adjustably supporting an upper roll wiper shaft and a lower roll wiper shaft, means for adjustably attaching the upper roll wiper to the upper roll wiper shaft so that rotation of said shaft in one direction moves a wiping edge of said upper roll wiper into wiping engagement with said upper roll and rotation of said shaft in the other direction moves said wiping edge out of engagement with said upper roll, means for adjustably attaching said lower roll wiper to said lower roll wiper shaft so that rotation of said lower roll wiper shaft in one direction moves a wiping edge of said lower roll wiper into wiping engagement with said lower roll and rotation of said shaft in the other direction moves said wiping edge out of wiping engagement with said lower roll, an upper roll wiper weight attached to said upper roll wiper shaft for urging said upper roll wiper shaft to rotate in a direction to urge the wiping edge of said upper roll wiper into wiping engagement with said upper roll, a lower roll wiper weight attached to said lower roll wiper shaft for urging said lower roll wiper shaft to rotate in a direction to urge the wiping edge of said lower roll wiper into wiping engagement with said lower roll.

5. The apparatus of claim 4 including an arm attached to and extending radially from said upper roll wiper shaft said upper roll wiper weight being attached to an end portion of said arm, whereby said upper wiper shaft is urged by said weight to rotate into a position in which said upper roll wiper is urged into wiping engagement with said upper roll, and an arm attached to and extending radially from said lower wiper shaft, said lower roll wiper

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weight being attached to an end portion of said last mentioned arm whereby said lower roll wiper shaft is urged by said weight to rotate into a position in which said lower roll wiper is urged into wiping engagement with said lower roll, said wipers being adapted to be moved out of wiping engagement with said rolls by lifting said weights to thereby rotate said shafts to move said wipers out of wiping engagement with said rolls.

6. The apparatus of claim 5 also including shielding means pivotally attached to said lower roll wiper shaft for shielding the portions of said doffer cylinder below said rolls from contact with stock which has passed through the rolls and with waste material which collects at the intersection of the wiping edge of said lower roll wiper with the lower roll, the pivotal connection between said lower roll wiper shaft and said shielding means permitting said shaft to be rotated to move the lower roll wiper out of engagement with the lower roll.

7. The apparatus of claim 6 wherein said doffer cylinder is provided with a doffer cylinder pan and wherein the lower portion of said shielding means rests against said doffer pan and the upper portion of said shielding means is hingedly attached to said lower roll wiper shaft.

8. In a carding apparatus comprising a doffer cylinder having a doffer cylinder pan, the improvement comprising an upper and a lower roll for rolling stock off from said doffer cylinder in the form of a web, a wiper for each of said rolls, shielding means for shielding the portion of said doffer cylinder below said rolls from coming into contact with the stock after it has passed through said rolls, said wiper for said lower roll comprising at least a part of said shielding means, said shielding means extending to said doffer cylinder pan.

9. In a carding apparatus comprising a doffer cylinder, the improvement comprising an upper and a lower roll from rolling stock off from said doffer cylinder in the form of a web, a wiper for each of said rolls, shielding means for shielding the portion of said doffer cylinder below said rolls from coming into contact with the stock after it has passed through said rolls, said wiper for said lower roll comprising a part of said shielding means, means for supporting the remainder of said shielding means for pivotal movement with respect to said wiper for said lower roll, said wiper for said lower roll being attached to a lower roll wiper shaft, means for rotatably supporting said shaft so that rotation of said shaft in one direction moves said wiper into wiping engagement with said lower roll and rotation in the opposite direction moves the wiper out of wiping contact with said lower roll, said apparatus also comprising means for urging said shaft to rotate in a direction in which said wiper is urged into wiping engagement with said lower roll, said remainder of said shielding means comprising a member which is hingedly attached to said shaft, whereby rotation of said shaft to move said lower roll wiper means out of engagement with said lower roll against the force exerted by said urging means can be affected without substantial movement of the remainder of said shielding means.

10. The apparatus of claim 9 wherein said means for urging said shaft to rotate comprises a weight.

11. In a carding apparatus comprising a carding cylinder and a doffer cylinder the improvement comprising means for rolling stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder rotates, said rolling means remaining stationary while deactuated, and freely rotatable ironing and compacting means for engaging and thereby compacting and ironing stock on the periphery of said doffer cylinder means after it rotates past said take off rolls and before it rotates past said carding cylinder at least during a portion of the time that said rolling means is deactuated.

12. The apparatus of claim 11 also including feeding

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means for feeding stock to said carding apparatus, means for deactuating said feeding means while said rolling means are deactuated, means for stripping said doffer cylinder while said rolling means and feeding means are deactuated and means for actuating said feeding means to load up said doffer cylinder with freshly carded stock while said rolling means continues to be deactuated and means for actuating said rolling means to roll said freshly carded stock off from said doffer cylinder after said doffer cylinder has been loaded, said compacting and ironing means comprising a compacting and ironing roll which is operative at least while said doffer cylinder is being loaded.

13. In a carding apparatus comprising a carding cylinder and a doffer cylinder the improvement comprising means for rolling stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder rotates, said rolling means remaining stationary while deactuated, freely rotatable ironing and compacting means for engaging and thereby compacting and ironing stock on the periphery of said doffer cylinder means at least during a portion of the time that said rolling means is deactuated, means for feeding stock to said carding apparatus, means for deactuating said feeding means while said rolling means are deactuated, means for stripping said doffer cylinder while said rolling means and feeding means are deactuated and means for actuating said feeding means to load up said doffer cylinder with freshly carded stock while said rolling means continues to be deactuated, means for actuating said rolling means to roll said freshly carded stock off from said doffer cylinder after said doffer cylinder has been loaded, said compacting and ironing means comprising a compacting and ironing roll which is operative at least while said doffer cylinder is being loaded and which when operative rests by its own weight on said doffer cylinder, said roll being rotated by contact with the rotating stock on the rotating doffer cylinder.

14. In a carding apparatus comprising a carding cylinder and a doffer cylinder the improvement comprising means for rolling stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder rotates, said rolling means remaining stationary while deactuated, freely rotatable ironing and compacting means for engaging and thereby compacting and ironing stock on the periphery of said doffer cylinder means at least during a portion of the time that said rolling means is deactuated, means for feeding stock to said carding apparatus, means for deactuating said feeding means while said rolling means are deactuated, means for stripping said doffer cylinder while said rolling means and feeding means are deactuated, means for actuating said feeding means to load up said doffer cylinder with freshly carded stock while said rolling means continues to be deactuated, means for actuating said rolling means to roll said freshly carded stock off from said doffer cylinder after said doffer cylinder has been loaded, said compacting and ironing means comprising a compacting and ironing roll which is operative at least while said doffer cylinder is being loaded, said roll being suspended by a pair of arms from brackets on the frame of said doffer cylinder, said roll being freely rotatable with respect to said arms and said arms being rotatably supported in said brackets, and wherein said roll rests on said doffer cylinder by its own weight, substantially all of the force asserted by said roll on said stock being supplied by the weight of said roll, said roll being rotated solely by contact with the rotating stock on the rotating doffer cylinder.

15. An apparatus for use in a carding machine having a rotatable doffer cylinder, said apparatus comprising means for rolling carded stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder means continues to rotate, said rolling means including means for

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holding stationary the web being rolled from said doffer cylinder means when said rolling means is deactuated by said means for deactuating said rolling means, whereby said web is broken by the continued rotation of said doffer cylinder and the end fibers of the broken end of said web are gripped by said holding means, said holding and rolling means including means for rolling carded stock off the doffer cylinder means together with the free ends of said fibers as a continuous web, when said rolling means is again actuated, and a freely rotatable compacting and ironing roll for engaging and thereby compacting and ironing stock on said doffer cylinder after it has rotated past said holding and rolling means and therefore after it has rotated past the free ends of said broken web.

16. An apparatus for use in a carding machine having a carding cylinder and a rotatable doffer cylinder, said apparatus comprising means for rolling carded stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder rotates, said rolling means including means for holding stationary the web being rolled from said doffer cylinder means when said rolling means is deactuated, whereby said web is broken by the continued rotation of said doffer cylinder means and the end fibers of the broken end of said web are gripped by said holding means, said holding means being spaced from said doffer cylinder means a distance which will permit the free ends of a substantial number of said end fibers gripped by said holding means to be dragged by contact with the periphery of card stock on said rotating doffer cylinder means at least to a point on the periphery of the card stock which is opposite the portion of the rolling means closest to the doffer cylinder means, said gripping and rolling means including means for rolling carded stock, together with said free ends of said end fibers, off said doffer cylinder means, as a continuous web, when said rolling means is again actuated, a freely rotatable compacting and ironing roll means for compacting and ironing the stock on said doffer cylinder after it rotates past said rolling means and before it rotates past said carding cylinder.

17. The apparatus of claim 16 for use in a carding machine having feeding means and including means for deactuating the feeding means at the same time that the rolling means is deactuated, means for stripping said doffer cylinder means while said rolling means and feeding means are deactuated and means for thereafter actuating said feed means to load up said doffer cylinder means with fresh carded stock, whereby said free ends of said end fibers of the broken web are dragged by the rotation of said doffer cylinder with said fresh carded stock thereon at least to a point around the periphery of said fresh carded stock which is opposite the portion of the rolling means closest to the doffer cylinder means, said means for rolling said carded stock and said free ends of said end fibers off from said doffer cylinder means being adapted to roll said fresh carded stock, together with said free ends of said fibers, off said doffer cylinder means, as a continuous web, when said rolling means is again actuated after said doffer cylinder means is properly loaded, said compacting and ironing roll means being operable at least while said doffer cylinder is being loaded up.

18. An apparatus for use in a carding machine having a rotatable doffer cylinder, said apparatus comprising means for rolling carded stock off from said doffer cylinder in the form of a web, means for actuating and deactuating said rolling means while said doffer cylinder rotates, said rolling means including means for holding stationary the web being rolled from said doffer cylinder means when said rolling means is deactuated, whereby said web is broken by the continued rotation of said doffer cylinder means and the end fibers of the broken end of said web are gripped by said holding means, said holding means being spaced from said doffer cylinder means a

distance which will permit the free ends of substantial number of said end fibers gripped by said holding means to be dragged by contact with the periphery of card stock on said rotating doffer cylinder means at least to a point on the periphery of the card stock which is opposite the portion of the rolling means closest to the doffer cylinder means, said gripping and rolling means including means for rolling carded stock, together with said free ends of said end fibers, off said doffer cylinder means, as a continuous web, when said rolling means is again actuated, freely rotatable compacting and ironing roll means for compacting and ironing the stock on said doffer cylinder, said carding machine having feeding means, said apparatus comprising means for deactuating the feeding means at the same time that the rolling means is deactuated, means for stripping said doffer cylinder means while said rolling means and feeding means are deactuated and means for thereafter actuating said feed means to load up said doffer cylinder means with fresh carded stock, whereby said free ends of said end fibers of the broken web are dragged by the rotation of said doffer cylinder with said fresh carded stock thereon at least to a point around the periphery of said fresh carded stock which is opposite the portion of the rolling means closest to the doffer cylinder means, said means for rolling said carded stock and said free ends of said end fibers off from said doffer cylinder means being adapted to roll said fresh carded stock, together with said free ends of said fibers, off said doffer cylinder means, as a continuous web, when said rolling means is again actuated after said doffer cylinder means is properly loaded, said compacting and ironing roll means being operable at least while said doffer cylinder is being loaded up, means for deactuating said compacting and ironing roll means while said rolling means is actuated and is rolling stock off from said doffer cylinder during normal carding operation.

19. A carding machine comprising in combination feed roll means, a doffer cylinder, a carding cylinder, take off rolls for removing carded stock from said doffer cylinder in the form of a web, calender roll means for calendering said web, means for driving said doffer cylinder, carding cylinder, take off rolls, calender roll means and feed roll means, control means for substantially simultaneously disengaging said take off rolls, said calender roll means and said feed roll means from the means for driving the same while said doffer cylinder and carding cylinder continue to rotate, timing means for automatically and substantially simultaneously reengaging said take off rolls and said calender roll means with the means for driving the same after a predetermined time has elapsed from the time said timing means is actuated, and means for substantially simultaneously actuating said timing means and for reengaging said feed roll means with the means for driving the same, means, operable at least during said predetermined time, for ironing and compacting the stock on said doffer cylinder after it rotates past said take off rolls and before it rotates past said carding cylinder.

20. An apparatus for use in a carding machine having feed roll means, a doffer cylinder and a carding cylinder, said apparatus comprising a pair of take off rolls for removing carded stock from said doffer cylinder, means for rotating said take off rolls in opposite directions, freely rotatable compacting and ironing roll means for compacting and ironing stock on said doffer cylinder, control means for disengaging said take off rolls and said feed roll means from the means for rotating the same and for actuating said compacting and ironing roll means while said doffer cylinder and carding cylinder continue to rotate, timing means for automatically reengaging said take off rolls with said means for rotating the same and for deactuating said compacting and ironing means after a predetermined time has elapsed from the time that said timing means is actuated, means for reengaging said feed roll

means with the means for rotating the same and for simultaneously actuating said timing means.

21. The apparatus of claim 20 for attachment to a carding machine having calender roll means and means for rotating the same, wherein said control means includes means for disengaging said calender roll means from the means for rotating the same at about the same time that said take off rolls are disengaged from their rotating means and wherein said timing means includes means for automatically reengaging said calender roll means with the means for rotating the same after said predetermined time has elapsed from the time said timing means is actuated and at about the same time said take off rolls are reengaged with their rotating means and said compacting and ironing roll means is deactuated.

22. In a carding apparatus comprising a doffer cylinder, the improvement comprising a pair of take off rolls for rolling stock off said doffer cylinder in the form of a web, first take off roll bracket means for adjustably and rotatably supporting one of said rolls at an adjustable distance from said doffer cylinder, second take off roll bracket means for rotatably and adjustably supporting the other of said rolls also at an adjustable distance from said doffer cylinder and around said first roll, a wiper for each of said rolls, wiper bracket means adjustably supported on said second take-off roll bracket means, for rotatably and adjustably supporting a wiper shaft, means for adjustably attaching a wiper to said wiper shaft so that rotation of said shaft in one direction moves a wiping edge of said wiper into engagement with one of said rolls and rotation of said shaft in the other direction moves said wiping edge out of engagement with said one roll, means for urging said wiper shaft to rotate in said one direction to urge the wiping edge of said wiper against the periphery of said one roll, said means for urging said wiper shaft to rotate in said one direction to urge said wiper into wiping engagement with said one roll comprising arm means extending radially from and attached to said first wiper shaft and having a weight attached thereto.

23. In a carding apparatus comprising a doffer cylinder, the improvement comprising a pair of rolls for rolling stock off said doffer cylinder in the form of a web, said pair of rolls comprising an upper roll and a lower roll, a wiper for wiping one of said rolls, wiper bracket means for rotatably and adjustably supporting a wiper shaft, means for adjustably attaching the wiper to the wiper shaft so that rotation of said shaft in one direction moves a wiping edge of said wiper into wiping engagement with said one roll and rotation of said shaft in the other direction moves said wiping edge out of engagement with said one roll, a wiper weight attached to said wiper shaft for urging said wiper shaft to rotate in a direction to urge the wiping edge of said wiper into wiping engagement with said roll.

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