Oct. 2, 1934. E. CLARK 1,975,741

CARD STRIPPING MECHANISM

Filed Sept. 10, 1930 5 Sheets-Sheet 1

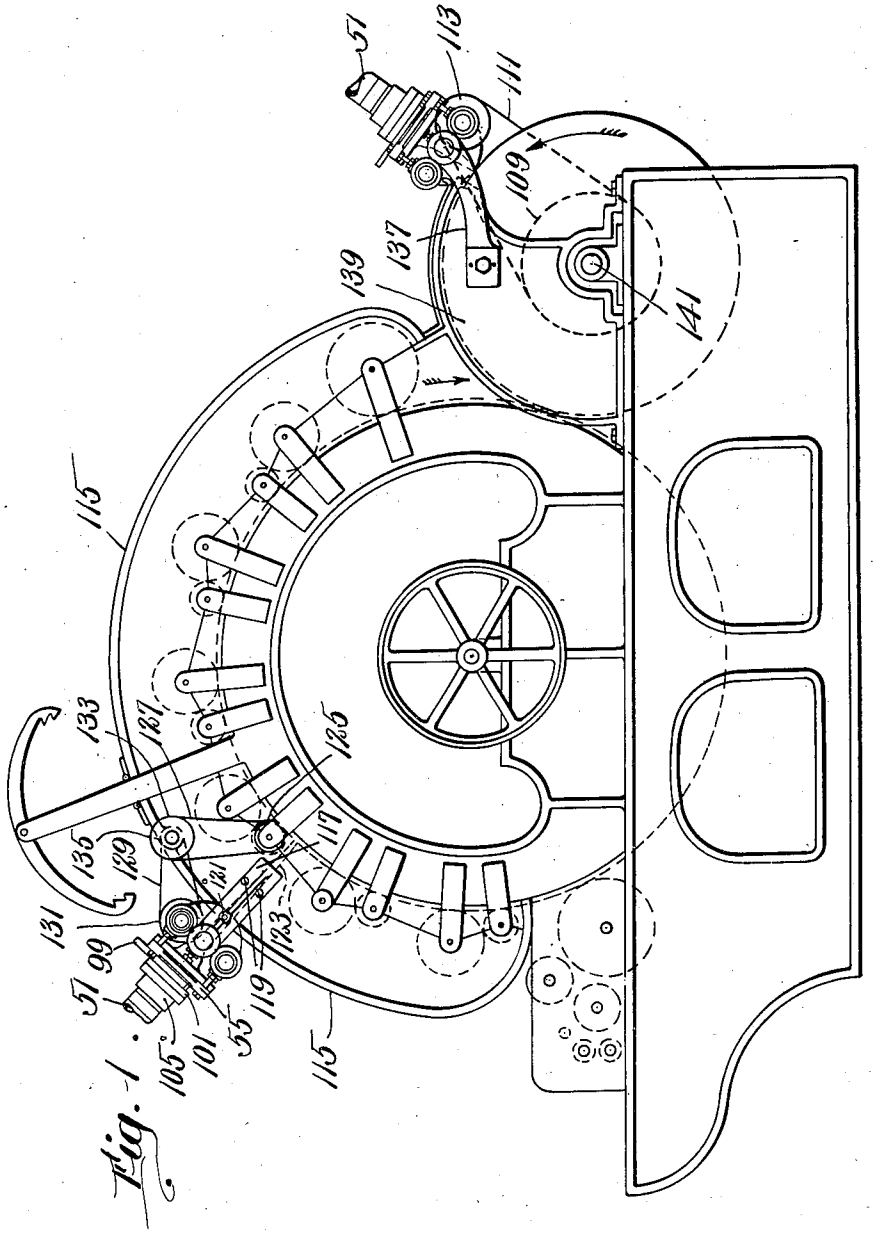


Fig. 1.

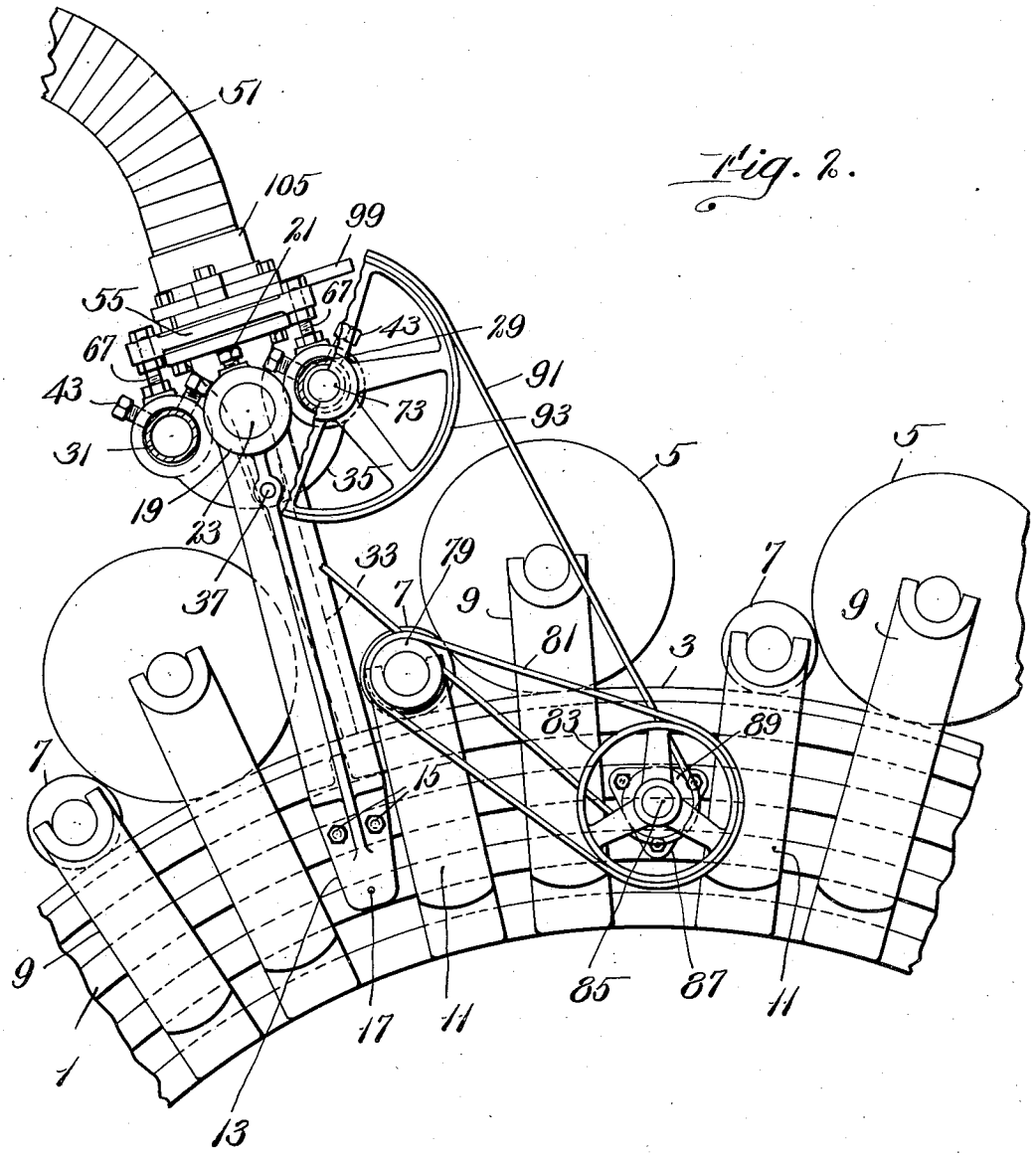
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Fig. 2.



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CARD STRIPPING MECHANISM

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Fig. 4.

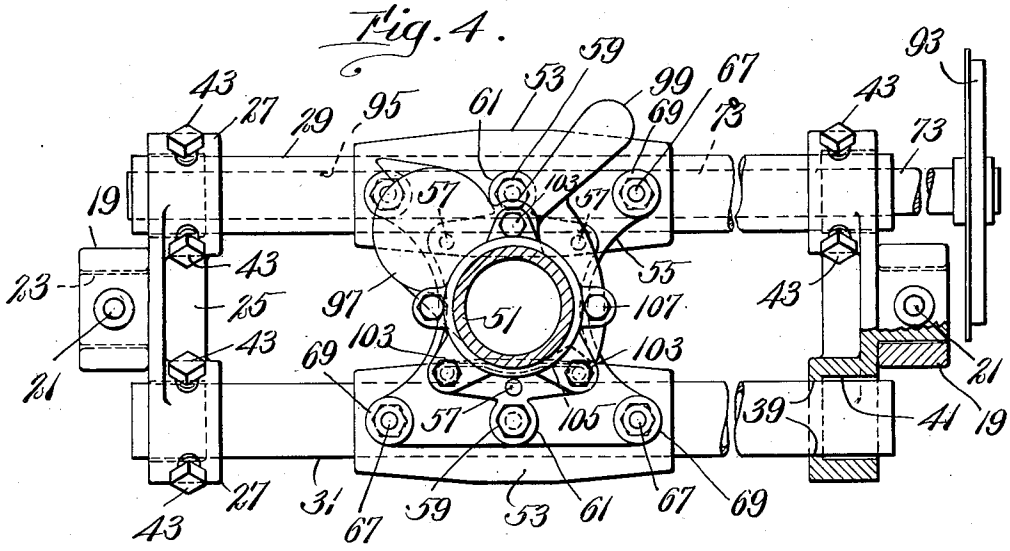
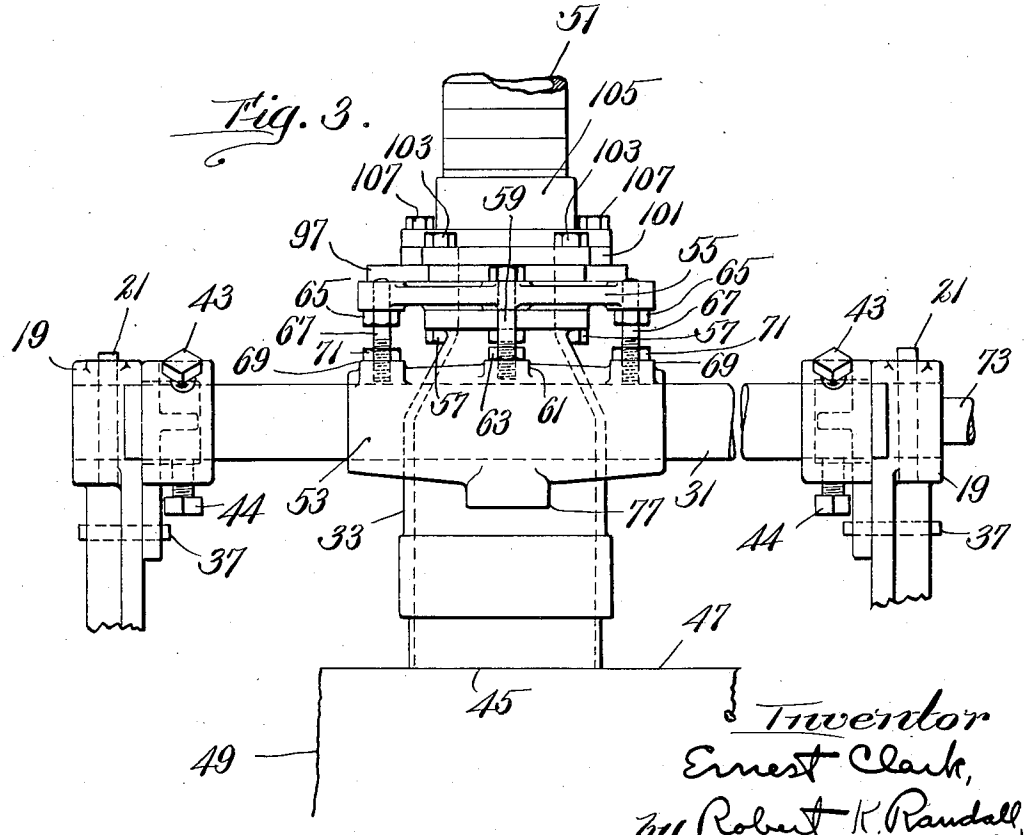


Fig. 3.

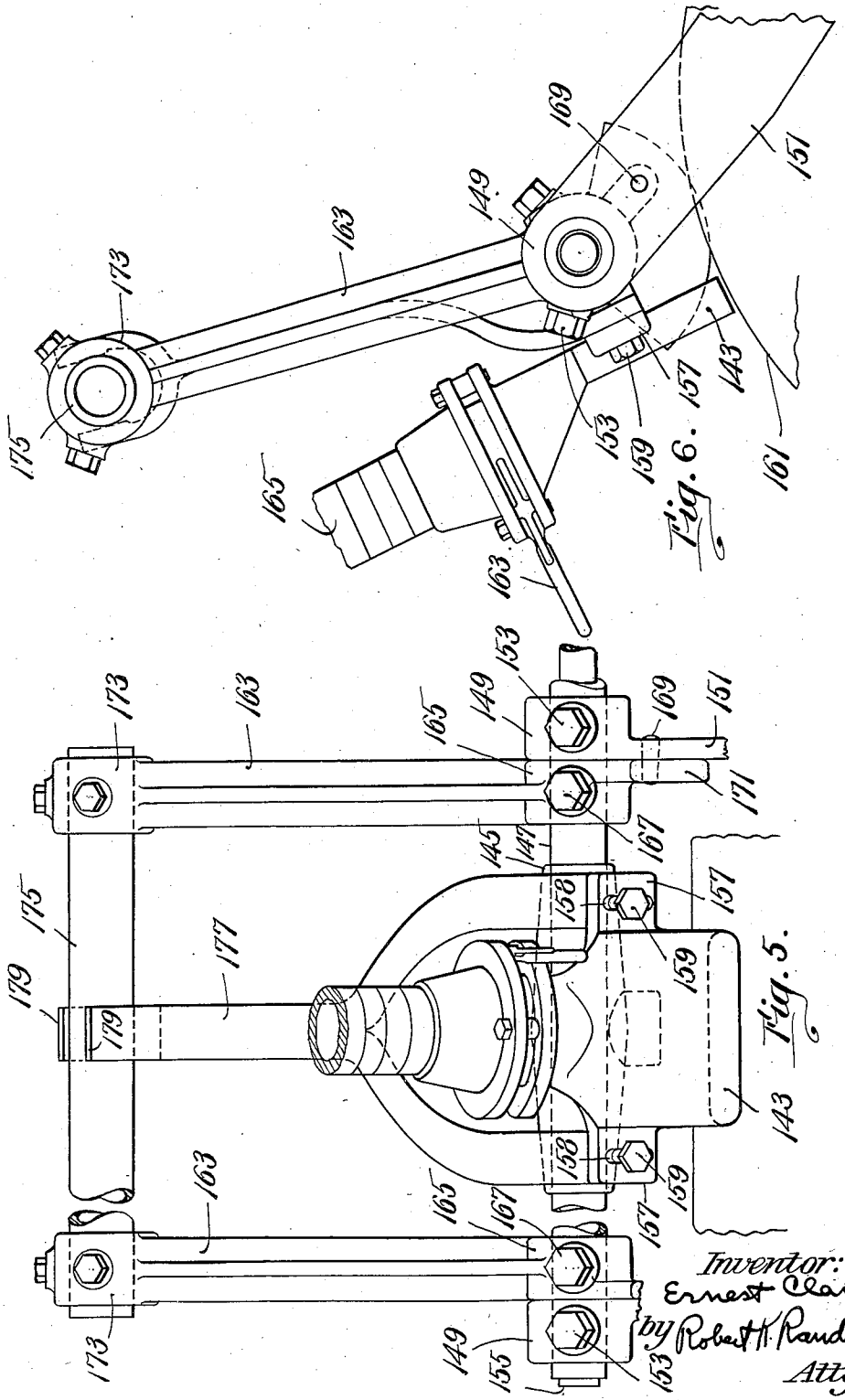


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CARD STRIPPING MECHANISM

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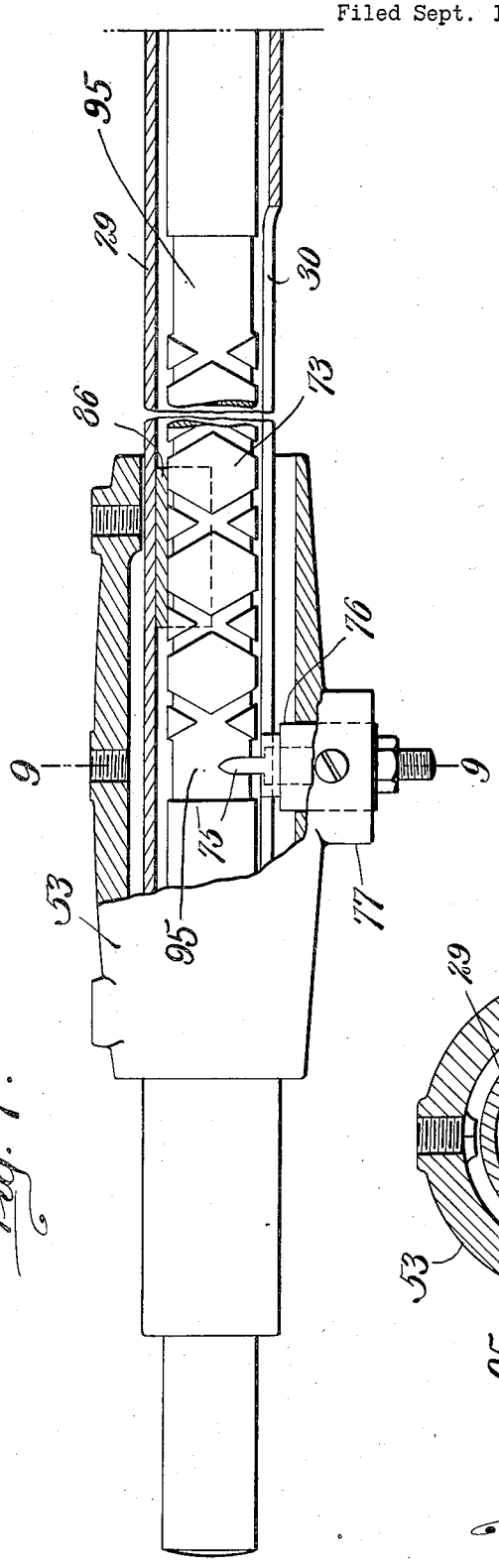


Fig. 7.

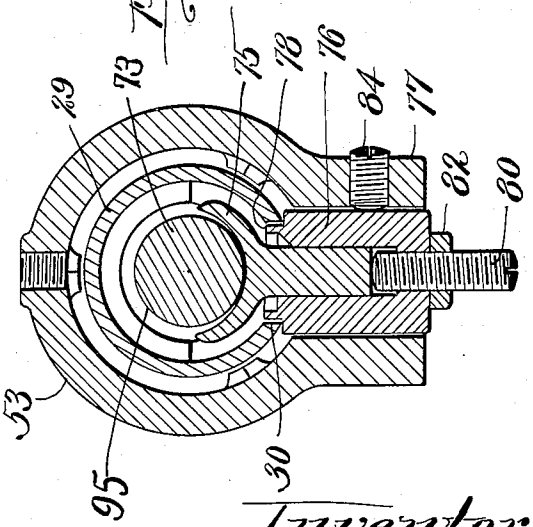


Fig. 8.

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UNITED STATES PATENT OFFICE

1,975,741

CARD STRIPPING MECHANISM

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Application September 10, 1930, Serial No. 480,968

34 Claims. (Cl. 19—109)

The present invention has relation to devices for stripping the main cylinders and doffers of roll cards and particularly to that class of such devices operating through localized exhaustion of air in the manner commonly termed vacuum stripping. One purpose of the present invention is to provide novel and improved mechanism for applying the principle of stripping by means of a traversing vacuum nozzle to the main cylinder of a roll carding engine, such as is used in carding wool, and which in certain instances is enclosed by hinged covers and also by shrouds which make necessary a departure from established practice in the application and mounting of such a nozzle. Another object of the invention is to provide novel and improved supporting means for a traversing nozzle which shall prevent the latter from descending into contact with and damaging the delicate and carefully arranged teeth of the card clothing, in the course of use and consequent wear of the parts effecting the traversing motion. Other objects are to provide for adjustment of the angular relation of the stripping nozzle with respect to the surface being stripped, and to provide improved means for adjusting its spaced relation to such surface, and for permitting removal and replacement of the nozzle without loss of such spaced and angular adjustments. Other objects are as will appear hereinafter.

The difficulties which have hitherto prevented successful vacuum stripping of roll cards have arisen chiefly from the nature of the fiber which is commonly carded on such machines, namely wool. In order to accomplish the carding of wool, the latter is heavily greased or oiled. The fibers are of a kinky nature, and when operated on by card clothing do not remain at the surface of such clothing as do cotton fibers, but embed themselves deeply in the wires in a thick and matted and partly felted condition. The difficulty in stripping a woolen card becomes more obvious when the bulk of the embedded fiber is considered; in a cotton card, the total weight of the strippings to be removed at a single stripping operation ordinarily never exceeds two pounds, whereas in a woolen card, the accumulation of greasy, kinky, clinging fiber extending deep down in the card clothing of the cylinder and doffer amounts to about forty pounds for each pair of such cooperating cylinders. To effect satisfactory stripping of a woolen card thus requires an effort many times greater than that capable of accomplishing like results in a cotton card.

To accomplish clean removal of woolen fibers from card clothing by a vacuum or suction nozzle alone, the velocity of the air entering the suction nozzle from among the wires of the card clothing must be relatively very great, and must likewise be of adequate volume. The velocity of air flow attainable through the nozzle and connected piping of a vacuum stripper system is very positively limited through the impossibility of attaining a difference in pressure between the surrounding atmosphere and the interior of the system greater than that capable of lifting a mercury column about 30''; in other words the maximum available difference in pressure is that existing between a perfect vacuum and the existing barometric atmospheric pressure, or about fifteen pounds. The unavoidable resistance to flow of air through the card clothing and the nozzle and connected piping system further greatly reduces the effective or working vacuum attainable at the stripping nozzle, so as to preclude entirely the simultaneous stripping of the main cylinder and doffer cylinder of the woolen card, after the manner commonly practiced in cotton cards, and also definitely limits the area of the opening of the single stripping nozzle which can be operated at the time.

It is necessary to set the stripping nozzle in the closest proximity to the surface of the card clothing the spacing ordinarily being on the order of 6/100 of an inch, in order to insure that the air entering therein shall come practically entirely from among the wires. The relatively high degree of vacuum needed in wool card stripping tends very strongly to pull the nozzle down into contact with the surface of the card clothing, and since the cylinder bearing such card clothing is being rotated at the time of stripping, this contact, if permitted, results in serious injury to or destruction of the expensive card clothing through facing or bending the teeth or wires out of working relation. At times the nozzle tends to swing reversely to the direction of rotation of the cylinder toward the fibers massed in the card-clothing, because the resistance to the inflow of air is the greatest on the side of the nozzle at which such massed fibers are being presented as a result of the rotation of the cylinder; at other times the rotation of the cylinder and the consequent travel of the surface being stripped tends unavoidably to carry the working end of the nozzle along with it in its rotation, on account of the rolling-up and accumulation of fiber under the leading edge of the nozzle, and the resultant slight swing of the nozzle upon its supports or mountings also

has frequently served to bring the nozzle in contact with the teeth of the card clothing, especially so since a single nozzle has to be used alone, and it is not possible to secure the compensating result attained in cotton card stripping devices by mounting two nozzles in combination on a single carriage and letting them work simultaneously on the oppositely rotating surfaces of main and doffer cylinders.

A further obstacle to successful stripping of wool cards has been the tendency of the support for the traversing nozzle to sag under its own weight when applied to span cards of a width of 60 to 100 inches, and this tendency is aggravated by the shifting weight of the nozzle during its traverse and by the strong suction necessarily used pulling downward on the nozzle and by the thrust of the vacuum hose attached to the nozzle adding its downward pressure intermediate the length of the traverse when it is stiffened up and contracted as a result of the high vacuum. These forces, and others such as the turning tendency exerted by the rotating traverse screw and the rotating surface being stripped, have made it extremely difficult to cause the working end of the nozzle to traverse the cylinder in a path truly parallel to the surface being stripped, and without being either too far from such surface at the ends of its traverse for effective stripping, or in dangerous proximity or in contact with the teeth or wire at intermediate points, or both.

In certain instances, roll cards are used for the purpose of carding cotton and other fibers than wool, in which cases it is necessary to provide covers and shrouds for the working upper half of the main cylinder and enclosing also the worker and stripper rolls cooperating therewith, as well as the doffer cylinder, in order to prevent escape into the room of lint and fly. The presence of such covers further complicates the problem of stripping roll cards by vacuum or suction methods. These obstacles to applying the known principles of vacuum card stripping to roll cards have hitherto proved so serious that so far as I am aware no operative device of this nature has hitherto been contrived; and I believe that I am the first to provide a successful and operative device of this nature.

To attain the objects and aims detailed, the invention consists in the novel and improved devices, constructions, and combinations of parts illustrated and described in the accompanying drawings and specification, and specifically pointed out in the claims appended hereto.

Illustrative embodiments of the invention are shown in the accompanying drawings in which,—

Fig. 1 is a side elevation of a typical roll card equipped with covers, showing certain features of the invention applied thereto.

Fig. 2 is a side elevation of certain of the parts of a typical roll card employed for carding wool, also showing certain features of the invention applied thereto.

Fig. 3 is an elevation and Fig. 4 a plan view of the form of supporting, traversing, and adjusting means for the stripping nozle, shown applied to the roll card having covers in Fig. 1 and to the woolen card in Fig 2.

Fig. 5 is a side elevation and Fig. 6 an end elevation, of an alternative form of supporting, traversing, and adjusting means for the nozzle.

Fig. 7 is a view of the traverse screw, slotted tube, and carriage, partly broken away, showing features of the carriage, screw, and follower.

Fig. 8 is a section on line 9—9 of Fig. 7.

Referring first to the improved stripping mechanism for roll cards operating upon wool, and shown in Figs. 2, 3 and 4:

At 1 is indicated a portion of the usual shroud or arch located adjacent the ends of the main cylinder of a woolen roll card, and having its upper edge 3 substantially flush with the card clothed surface of the main cylinder of the card. At 5 and 7 are indicated respectively the worker and stripper rolls, mounted by journals on brackets 9, 11, secured in suitable manner to the outward face of the shroud 1. Also attached to the shroud 1 at each end of the main cylinder is a bracket 13, firmly mounted on the shroud by bolts 15 and further secured against becoming loose thereon by a pin 17 driven through its lower extremity and into the face of the shroud.

At its upper end each of the two brackets 13 is provided with a hollow hub 19 within which is fixedly secured by a pin 21 the stud 23 on a mounting member 25 which has a pair of hubs 27 formed therein in spaced relation to receive the ends of the bars or tubes 29, 31, on which the nozzle 33 and its carriage slide back and forth during their traverse movement. The mounting member 25 has a depending semi-circular flange 35 extending from one hub 27 to the other thereof, this flange being pinned to an intermediate portion of the length of the bracket 13 by a pin 37 to prevent all possibility of relative swinging motion of the member 25 with respect to the bracket 13 about the center of the stud 23 on such member.

The hubs 27 formed in the mounting member 25, as shown clearly in Fig. 4, have the inward ends 39 of the passages therethrough of a diameter approximating very closely the outside diameter of the bars 29, 31, whose ends fit into such hubs, while the remainder of the length of such passages is of considerably greater diameter than the bars, as indicated at 41. Thus the constricted portions of such passages constitute circular abutments supporting the bars and against which the bars may be pressed through radially directed pressure exerted by such means as the screws 43, bearing against the ends of the bars within the relieved portion 41 of the passages and in offset or disaligned relation with respect to the abutments 39, to bend or warp or spring the intermediate length of each bar extending across the width of the card, to change the shape of such intermediate portion of each bar in such direction and to such extent as may be needed to compensate for the sag and deflection of such bars in use and to cause the working end 45 of the stripping nozzle, when the latter is traveling along the bars, to travel in a path more or less exactly parallel to the surface 47 of the card clothing of the main or doffer cylinder 49. As the idea is to correct and compensate for deflection of the bars 29, 31, in a mainly downward direction, the adjusting or pressure-screws 43 are applied to the upper half of the circuit of each hub 27, and through being spaced apart at an angle of 90 degrees from each other and placed at an angle of 45 degrees with respect to the plane in which the two bars extend, they are capable of imparting all needed deflection to the intermediate portions of the bars in the various directions needed above the plane in which the bars extend. By proper manipulation of the screws 43 it is thus possible to give to the bars such a shape that the working end 45 of the nozzle 33 will travel in a path very closely paralleling the surface of the card clothing, in spite of the natural sag of the bars under their own weight, combined with the

deflection produced by the shifting burden of the carriage with its nozzle and the attached vacuum hose 51. A screw 44 is also provided, bearing against the underside of the bars 29, 31, to lock the bars in adjusted relation attained by manipulation of the pressure-screws 43.

The nozzle 33 is supported and driven along the length of the bars 29, 31, by being combined with the carriage which comprises two sleeve-like portions 53 adapted to fit closely though slidably about the exterior of the supporting bars 29, 31, and including a portion 55 to which the nozzle is suitably affixed, as by the three bolts 57. The portion 55 has a central aperture coinciding with the internal passage through the upper end of the nozzle, and is combined with the two sleeve-like portions 53 by means of screws 59 passed through the portion 55 and threaded into bosses 61 on the portions 53, locknuts 63 bearing against such bosses to prevent loosening of the setting of the screws 59. The screws 59 hold the portion 55 down against a plurality of bearing-points defining a plane and constituted by the upper surfaces of flanges 65 having the shape of cap-screw heads but formed intermediate the length of pins 67 the lower ends of which are threaded into bosses 69 at the extreme ends of the sleeve-like portions 53 and secured therein by locknuts 71. The smooth upper-end portions of the pins 67 are received within appropriate holes in the portion 55. This arrangement provides a four-point bearing between the portion 55 carrying the nozzle and the portions 53 which slide along the bars 29, 31, each of such bearing-points being adjustable as to its spaced relation from the surface of its respective sleeve-like portion 53, and hence from the surface of the bars 29, 31, defining the path of traverse movement of each portion 53. By providing four of such adjusting bearing-points, arranged equi-distant from each other and from the axis of the nozzle, adjustment of the spaced relation and also of the angular relation of the portion 55 with respect to the plane of extent of the bars 29, 31, is facilitated, as through manipulating any two adjacent ones of the screw-pins 67 the portion 55 may be tipped in one plane, followed by a simultaneous manipulation of one of said screw-pins and its next adjacent neighbor to tip the portion 55 in a plane at right angles to the first.

Thus is provided novel means for adjusting both the spaced relation of the working end 45 of the nozzle with respect to the surface 47 being stripped, and the angular relation of the axis of the nozzle with respect to such surface, as the nozzle is borne by the portion 55 of the carriage, and the spaced and angular relation of such portion is adjustable as described with respect to the two bars 29, 31, which form the support for the carriage during its traverse, and which are arranged each with its extremities at equal heights above the surface to be stripped and thus extend in the nearest possible parallelism with such surface. The purpose of the adjustment of the spaced relation of the nozzle to the card-clothing is of course to cause the nozzle to strip effectively through being positioned very close to the teeth of the card-clothing. The purpose of the provision for angular variation of the nozzle, with its capacity for universal adjustment, is to enable the nozzle to be disposed in the most effective manner, for accomplishing thorough removal of the embedded fibers. Further, removal of the screws 59 permits removal of the nozzle and connected parts from the carriage, and replacement without loss of its spaced relation to the card-clothing. The bearing-points define a mounting-plane which after adjustment remains in fixed spaced and angular relation to the surface being stripped.

Though the nozzle usually works best when disposed with its axis radial with respect to the cylinder being stripped, in certain instances it has been found to effect cleaner stripping when its working end points a very slight amount in the direction of rotation of the cylinder, for then the air enters the nozzle more exactly in line with the backwardly-inclined lower portions of each of the wires of the card-clothing, and this has sometimes been found efficacious in removing wool which tends to pack deeply in the clothing near the base of the wires. The angular adjustment feature serves a number of other useful purposes, such as facilitating proper setting up of the parts, and compensation for wear, etc.

The carriage receives its propulsion along the bars 29, 31, forming its support through the traverse screw 73, mounted within one of the bars or tubes, herein the one indicated at 29, and formed with double and oppositely directed threads. The tube 29 is slotted at 30 at its under side in usual manner to provide for the familiar follower or crutch 75, which is swivelled in a bearing 76 in the boss 77 on the under side of the sleeve-like portion 53, such bearing being provided with a reduced portion 78 to slide within the slot 30 of the tube and being fixedly retained in the boss 77. A screw 80 is also provided in the bearing to hold the follower in working relation with the threads of the traverse screw 73, and provides for adjustment for wear, etc., a locknut 82 being used to clamp the screw 80 in a fixed position after the follower 75 has been given its working position. The bearing 76 is fixed in position within the boss by a clamping screw 84 so that its reduced end 78 is properly entered within the slot 30 of the tube. The purpose of these provisions is to prevent the follower from disengaging with the threaded portion of the traverse screw in its travel, to prevent rotative movement of the carriage around the slotted tube 29, and to provide easy compensation for wear. Further, the method of mounting the follower keeps it entirely out of contact with the edges of the slot 30, so that the combination of forces resulting from the rotation of the screw and tending to bring the shank of the follower against the sides of the slot while the follower is being traversed along the slot, will not give rise to the tendency to rotate the follower on its axis through frictional engagement at one side thereof, which has caused serious trouble in the past through making the follower enter the return thread of the screw before it has completed its traverse, and also through tending to cause the follower to leave the screw threads entirely, resulting in failure to traverse or breakage or serious damage to the follower and associated parts. The adjusting screw 80 also cooperates with the bearing 76 in holding the follower to its work, through preventing escape of the follower from the screw threads.

The bar or tube 29, being more or less weakened through being slotted at its under side, is supported and strengthened by the traverse screw 73 through the use of half bearings 86 distributed along the inner face of the tube 29, such bearings being located diametrically opposite the slot in the tube and within the limits of the traverse of the carriage. Similarly, the traverse screw is

supported against deflection by the slotted tube, with the result that the two members are maintained in truly concentric relation, and the forces resulting from the presence of the follower between them cannot cause the follower to escape from the threads.

The traverse screw is driven in novel manner through combining it with one of the stripper rolls 7, such drive having the advantage of taking its motion from such relatively positively and steadily driven member instead of from the worker rolls which are more uncertain and prone to slip in their driving connections. To slow down the drive taken from the rather rapidly rotating stripper roll, and to increase the power and steadiness of the traverse screw, a small flat pulley 79 is applied to the stripper roll shaft, and connected by a short belt 81 with a larger flat pulley 83 on a stud 85 affixed by a bracket 87 to the outer face of the shroud 1, the pulley 83 having combined with it a smaller pulley 89 connected by belt 91 with the driving pulley 93 fixed on the exposed end of the traverse screw 73. This arrangement provides for complete and simple removal and easy replacement of the belt 81, and this belt is in practice utilized by the card-stripping hand of the mill as the key or controlling member of the stripping devices, there being only one such belt provided for a single carding-room and the hand carrying it about with him from one card to the other as each needs to be stripped, thus preventing unauthorized or accidental starting-up of the stripping devices with resultant loss or damage. It also provides that the traverse screw shall stand still except when the device is in the act of stripping, thus reducing the opportunity of the screw to collect fiber and lint entering through the slot in the tube while the screw is turning, and tending to foul the screw and interfere with the traverse of the carriage.

The traverse screw 73 has a novel feature in the provision of a portion 95 at the end of the traverse screw from which the carriage and nozzle start their traverse when the stripping action begins, such portion having a diameter less than that of the working portions of the screw thread formed in or on the traverse screw, so that the follower 75 may take a position abreast of such portion and maintain this position without traversing movement while the screw 73 is rotating. Herein this standing-place in which the follower remains at rest is in the form of a groove extending circumferentially around the traverse screw and communicating with both of the oppositely cut threads of the screw so that when the carriage has performed its traverse and completed the stripping operation through engagement of the follower with the proper one of the two threads, it will come to rest though the screw continues to be rotated. The advantage of this provision is that when the attendant starts in to strip the card by applying the belt 81 to begin the rotation of the traverse screw, and at the same time opens the valve 97 to start the suction, the nozzle will not immediately start away from the end of the cylinder in a manner leaving a certain portion of the card-clothing adjacent that end of the cylinder unstripped. Instead, the carriage and nozzle stand still while the nozzle strips the cylinder in a circular path at the extreme end of the cylinder, and the follower enters into the traverse screw to begin its traverse only when pressed in the proper direction for such engagement by the attendant's hand.

The valve 97 and the associated coupling parts combining it and the extremity of the hose 51 with the nozzle are as described in my co-pending application for U. S. Letters Patent No. 448,575, filed April 30, 1930. The valve is of spectacle shape with one lobe thereof having an aperture of a diameter equivalent to the passage through the hose and adapted to be aligned therewith, while the other lobe is solid and adapted to block the entrance of air into the hose when aligned with the latter's passage. The valve has an operating handle 99 and is confined between the top surface of the portion 55 of the carriage and a star-shaped piece 101 attached by screws 103 to the portion 55, a spring extending across from one of such screws to another to bear against the periphery of the valve 97 and hold it in adjusted relation, and the valve being pivoted on the shank of the third of such screws 103. The coupling piece 105 on the end of the hose 51 is applied to the top surface of the star-shaped piece 101 by screws 107 put through lugs on the coupling piece and threaded into the piece 101.

It will be observed that the described organization for supporting and traversing the nozzle is so contrived that the force exerted on the nozzle incident to rotation of the surface being stripped, and acting to pull the working end of the nozzle along with such surface out of its intended operating position, tends to swing the nozzle about an axis lying in a radial plane with respect to the cylinder being stripped, and passing between the two supporting bars 29, 31. In other words, with the bars 29 and 31 of approximately equal resistance to deflection, the axis around which the nozzle tends to be turned will lie substantially midway between the axes of the two bars 29 and 31, that is substantially on the axis of the studs 23 of the mounting pieces 25. The parts are arranged so that the axis of the nozzle intersects this horizontal axis of rotation about which the nozzle tends to swing. Thus is attained the desired chief result of keeping the nozzle from coming in contact with the teeth of the card-clothing when it deviates, as it unavoidable does, from its intended working position as a result of the rotation of the surface being stripped. A second result is that through defining an axis about which this swinging action of the nozzle shall take place, other than on the axis of the traverse screw, the follower and the sides of the slot in the tube 29 through which the follower works, and the traverse screw itself, are relieved of the burden and rapid wear to which they are subjected when the nozzle tends to turn around the traverse screw and its enclosing tube as a center, and is held from such rotation only by the engagement of the follower with one side of the slot in the tube, an arrangement not at all practicable where such high vacuum and a long nozzle are used.

When the described organization is employed for stripping the doffer, the installation and operation are substantially the same as described, the only differences being that owing to the absence of the rolls working on the main cylinder the support can be set closer to the card-clothing, and the nozzle hence is shorter; the brackets corresponding to 13 of Fig. 2 are attached to convenient portions of the frame or housing, and may be curved instead of straight; the traverse screw pulley is connected with a pulley on the shaft of the doffer similar to that indicated at 109 in Fig. 1 by a removable belt as shown at 111 in such figure, running over the corresponding pulley 113 on the traverse screw.

The problem of applying vacuum stripping devices to covered roll cards has been met in the case of wide cards, measuring from 60 to 100 inches across, by applying the described devices to one of the two covers 115, preferably the shorter and lighter of the two, after the manner shown in Fig. 1. The brackets 117, corresponding to those indicated at 13 of the previously described arrangement, are secured by screws 119 and pins 121 to the vertical side portions of the cover, instead of to the shroud, and the nozzle 123 extends down into working relation with the surface of the card-clothing on the main cylinder through a transverse slot in the cover closely approximating in its width the thickness of the nozzle and extending all the way across the cover. The traverse screw is similarly driven from a pulley 125 fixed on the end of the shaft of one of the strippers, extended out beyond the side of the cover, the drive including the belts 127, 129, and the single and double pulleys 131, 133, the latter being mounted on a stud 135 fixed to the side of the cover 115. The card-stripping hand again in this instance starts and stops the traversing of the nozzle by respectively applying and removing the belt 127. When this belt is removed the cover may be lifted in the ordinary manner to give access to the parts enclosed thereby, the stripping devices of course being lifted with the cover. With this arrangement, the sides of the slot in the cover engage with the nozzle and assist materially in preventing the nozzle being swung out of its intended operating position as a result of the rotation of the surface being stripped, a feature which is of value where so long a nozzle must be used in order to reach the card-clothing through the cover.

The stripping devices are applied to the doffer of a covered roll card in any suitable or desired manner. The doffer being covered throughout only for a portion of its circumference the stripping, supporting and traversing devices may be mounted as shown in Fig. 1 so that the nozzle operates upon an exposed portion of the doffer, the device being supported on curved brackets 137 and screwed and pinned to the housing 139 of the doffer. The traverse screw is driven by means of a pulley 109 fixed on the doffer shaft 141 and connected by belt 111 with the pulley 113 fixed on the end of the traverse screw shaft.

An alternative form of the invention utilizing the described principles of oppositely directed and hence compensating deflection of the supporting and guiding bars on which the nozzle has traversing movement is shown in Figs. 5 and 6. This form is especially designed to be used on covered roll cards of 48 inches or less in width, where the problem of causing the working end of the nozzle to traverse in substantial parallelism with the surface of the card-clothing is not rendered so difficult owing to the sag of the support when called on to span a relatively great width. Figs. 5 and 6 show the application of this alternative form to the stripping of the doffer. The construction of the traversing mechanism for the nozzle 143, as well as the nozzle itself, may be of any suitable or preferred form, that illustrated therein being of well-known design comprising a carriage 145 sliding freely upon a bar or tube 147 extending across the width of the machine and fixed by screws 153 in hubs 149 at the ends of brackets 151 affixed to the housing of the doffer, the bar or tube being slotted throughout its length to permit the usual follower combined with the carriage 145 in well-known manner to extend radially inward through it to engage the thread of the enclosed traverse screw 155.

Nozzle 143 is provided with laterally extending flanges 157 having vertical slots 158 through which are passed clamping screws 159 threaded into the side of the carriage, the slots providing for adjustment of the nozzle up and down with respect to the carriage to vary the spaced relation of its working end with respect to the surface of the card-clothing 161 on the doffer, the slots being oversized with respect to the shanks of the screws to permit also of angular adjustment of the working end of the nozzle into proper conformity with the surface 161.

The alternative form of the invention provides improved means for preventing the working end of the nozzle from tending to follow the rotating surface being stripped, comprising additional brackets 163 mounted on the exterior of the bar or slotted tube 147 by means of hubs 165 at their lower ends, these hubs being clamped to the bar 147 by clamping screws 167, and further secured against change of their angular relation with respect to the brackets 151 by means of pins 169 driven through the latter brackets and through integral wings 171 formed on the brackets 163 below said hubs. At the upper extremities of brackets 163 are hubs 173 within which is fixed by clamping screws a guiding member of suitable straight stock herein conveniently formed of a tube 175, which by reason of such mounting is caused to extend across the width of the doffer cylinder parallel to the axis of the latter.

There is combined with the traversing carriage a guide arm 177 which is rigidly affixed to such carriage and extends into contact with the said guiding member or tube 175 in such manner as to prevent a swinging movement of the nozzle when its working end is dragged along by the moving card-clothing. This guide arm is conveniently formed of wishbone shape, forking toward its lower end to provide two branches which are secured to the carriage 145 by the bolts 159 which attach the nozzle 143 to such carriage. The upper end of the guide arm is also forked though in a plane at right angles to that of its lower end to receive between its upper extremities 179 the guiding member or tube 175.

As the carriage is traversed to carry its stripping nozzle across the doffer, the forked upper end of the guide arm 177 slides freely back and forth along the guide member or tube 175. As a result of the relatively great radius of the arm 177 with respect to the radial distance of the end of the nozzle from the axis of traverse screw 155, no appreciable swinging movement of the nozzle and carriage about the axis of the traverse screw can occur as a result of the pull of the surface being stripped against the nozzle, any turning impulse thus imparted to the nozzle tending to act about a center lying somewhere between the tubes 147 and 175 and tending to produce substantially equal and hence compensating deflection of such bars in opposite directions. Thus the burden of preventing rotation of the nozzle and carriage about the axis of the traverse screw, hitherto borne by the follower, is taken from the follower which engages the thread of the traverse screw and put upon the much more substantial parts comprising the arm 177 and tube 175. Any wear occurring between these last named two parts will have slight effect in bringing the working end of the nozzle into dangerous proximity

to the teeth of the card-clothing, on account of the length of the radius arm comprised by the arm 177 and the flatter arc on which the working end of the nozzle tends to swing resulting from lifting the axis about which it is deflected, to a point well above the axis of the traverse.

I claim:—

1. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, and means for deflecting the support to determine the path of travel of the stripping device.

2. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, and means for modifying the shape of the support to compensate for deflection under the forces acting thereon.

3. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, and means for bending the support reversely to the direction of deflection caused by the forces acting on the support.

4. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, and means engaging the ends of the support to determine the shape of the intermediate portions thereof.

5. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, an abutment engaged by an end of the support, and means engaging the support and cooperating with the abutment to modify the shape of the support.

6. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, an abutment engaged by an end of the support, and means for applying pressure to the support in offset relation to the abutment to compensate for deviations in the shape of the support resulting from the sag of the support and from forces transmitted to the support by the carriage.

7. Card stripping mechanism having, in combination, a traversing carriage, a stripping device in connection with the carriage, a support for the carriage in its traverse, abutments engaging the end-portions of the support, and screws exerting transverse pressure on the support to deflect the intermediate portions of the length of the support.

8. Vacuum card stripping mechanism having, in combination, a traversing carriage, a stripping nozzle in connection with the carriage, and a support for the carriage in its traverse comprising parallel resilient members disposed so that deviation of the stripping nozzle incident to rotation of the card-surface being stripped tends to spring the members and thus to rotate the stripping device about a center between but apart from the respective members and lying in a plane radial to the surface being stripped and passing through the mouth of the nozzle when in its intended stripping position.

9. Vacuum card stripping mechanism having, in combination, a traversing carriage, and a support for the carriage in its traverse comprising parallel bars, guides on the carriage engaging said bars, and a nozzle between the bars and combined with the carriage at a point midway between the bars, with the bars contrived to have substantially equal resistance to deflection.

10. Vacuum card stripping mechanism having, in combination, a traversing carriage, a support therefor while traversing, and a stripping nozzle combined with the carriage having capacity for adjustment of its working angular relation to the surface being stripped.

11. Vacuum card stripping mechanism having, in combination, a traversing carriage, a support therefor while traversing, and a stripping nozzle combined with the carriage having capacity for universal adjustment with respect to the nozzle-supporting means.

12. Vacuum card stripping mechanism, having, in combination, a traversing carriage, a support therefor while traversing, and a stripping nozzle combined with the carriage having capacity for universal adjustment with respect to the surface to be stripped.

13. Vacuum card stripping mechanism having, in combination, a traversing carriage, a support therefor while traversing, and a stripping nozzle combined with the carriage having capacity for adjustment of its spaced and angular relation to the surface being stripped.

14. Vacuum card stripping mechanism having, in combination, a traversing carriage, a support therefor while traversing, a stripping nozzle combined with the carriage, and means for adjusting the spaced and angular relation of the carriage with respect to the support.

15. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a traversing carriage for such nozzle, a support for the carriage while traversing, and means for varying the spaced and angular relation of the carriage with respect to the support to adjust the spaced relation and angularity of the nozzle with respect to the surface being stripped.

16. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage for the nozzle traveling on the support and having capacity for universal adjustment of its angular relationship with respect to the support and for adjustment of its spaced relation to the surface being stripped.

17. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage for the nozzle traveling on the support and having capacity for universal adjustment of its angular relationship with respect to the support and also having capacity for adjustment of its spaced relation to the support.

18. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the support, the two portions being relatively adjustable to vary their angular relations to each other.

19. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the support, the two portions being combined through the use of a plurality of bearing points, at least one of which is adjustable to vary the angular relation between the two portions.

20. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the

support, the two portions being combined through the use of a plurality of bearing-points on one of such portions, adjustable with respect to such portion to vary the angular and spaced relation between the two portions.

21. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the support, the two portions being combined through the use of a plurality of bearing-points on one of such portions, adjustable with respect to such portion and adapted to permit separation and reconnection of the other portion without loss of the adjusted relation of the two portions.

22. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the support, the two portions being combined through the use of a plurality of bearing-points on one of such portions, adjustable with respect to such portion to vary the spaced relation between the two portions.

23. Vacuum card stripping mechanism having, in combination, a stripping nozzle, a support, and a traversing carriage comprising a portion combined with the nozzle and a portion engaging the support, the two portions being combined through means including leveling-screw devices providing universal angular adjustment between the two portions.

24. Vacuum card stripping mechanism for roll cards having a cover for the rolls, comprising the combination with the cover, of a traversing stripping device, means for imparting traversing movement to the device, and driving connections between such means and the said rolls.

25. Card stripping mechanism having, in combination, a traversing stripping device, a support therefor while traversing comprising parallel bars, guides traveling along said bars, and means combining the stripping device with such guides with capacity for varying the spaced relation of the stripping device with respect to the guides.

26. Stripping means for roll carding engines comprising the combination with the cover for the rolls, of a stripping device adapted to operate upon the main cylinder, a carriage therefor, a traverse screw upon which said carriage is adapted to travel, supporting means for combining said traverse screw rotatably with said cover, and driving means between the traverse screw and the rolls for imparting rotation to the traverse screw.

27. Stripping means for roll carding engines comprising the combination with the removable cover for the rolls, of a traversing stripping device adapted to operate upon the main cylinder, and means for deriving actuation from a roll to traverse the same, said means being disconnectible to permit opening of the cover.

28. Vacuum stripping means for roll carding engines comprising the combination with the removable cover for the roll cards, of supports in connection therewith, a traverse screw rotatably mounted in said supports, a traversing carriage driven by the traverse screw, a stripping nozzle upon said carriage adapted to extend through said cover to operate upon the main cylinder, and means for driving said traverse screw from a roll, disengageable to permit raising of the cover.

29. Vacuum stripping means for carding engine cylinders comprising the combination with a vacuum stripping nozzle, a carriage therefor, and a traversing screw actuating said carriage, of a guide arm combined with said nozzle and a guiding member disposed parallel to the axis of the traverse screw and engaged by said guide arm at a distance from said axis at least as great as the distance from the working end of said nozzle to said axis, to prevent departure from the desired angular disposition of said nozzle-end about said axis.

30. Card stripping mechanism having, in combination, a stripping device, traversing means therefor including a slotted tube and a traverse screw within the tube, and means intermediate the extent of the tube and of the screw to maintain them in spaced and concentric relation.

31. Card stripping mechanism having, in combination, a stripping device, traversing means therefor including a slotted tube and a traverse screw within the tube, and means engaging with the proximate surfaces of the tube and the screw to maintain the intermediate portions of their extents in predetermined spaced relation.

32. Card stripping mechanism having, in combination, a stripping device, traversing means therefor including a slotted tube and a traverse screw supported at its ends in spaced relation within the tube, and a bearing surface within the tube engaging with the screw intermediate the supported ends of the latter.

33. Card stripping mechanism having, in combination, a stripping device, traversing means therefor including a slotted tube and a traverse screw in spaced relation within the tube, and means engaging the proximate surfaces of the tube and screw intermediate their extent to cause them mutually to support each other during the traverse of the stripping device.

34. Card stripping mechanism having in combination a stripping device, traversing means therefor including a slotted tube and a traverse screw within the tube, a follower engaging with the screw to impart traversing movement to the stripping device and having a cylindrical tang, and a sleeve fixed in the stripping device extending through the slot in the tube concentrically with the tang to maintain the latter in spaced relation to the sides of the slot and means engaging the sleeve and the follower to vary the relation of the follower and screw.

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