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L. L. FOSS.
COTTON ROPING GINNING MACHINE.
FILED MAR. 12, 1921.

3 SHEETS-SHEET 1

Fig. 1 - 121

Fig. 2 - 122

Fig. 3 - 123

16-11

1, 4, 10, 16, 27, 39, 41, 42, 48, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123

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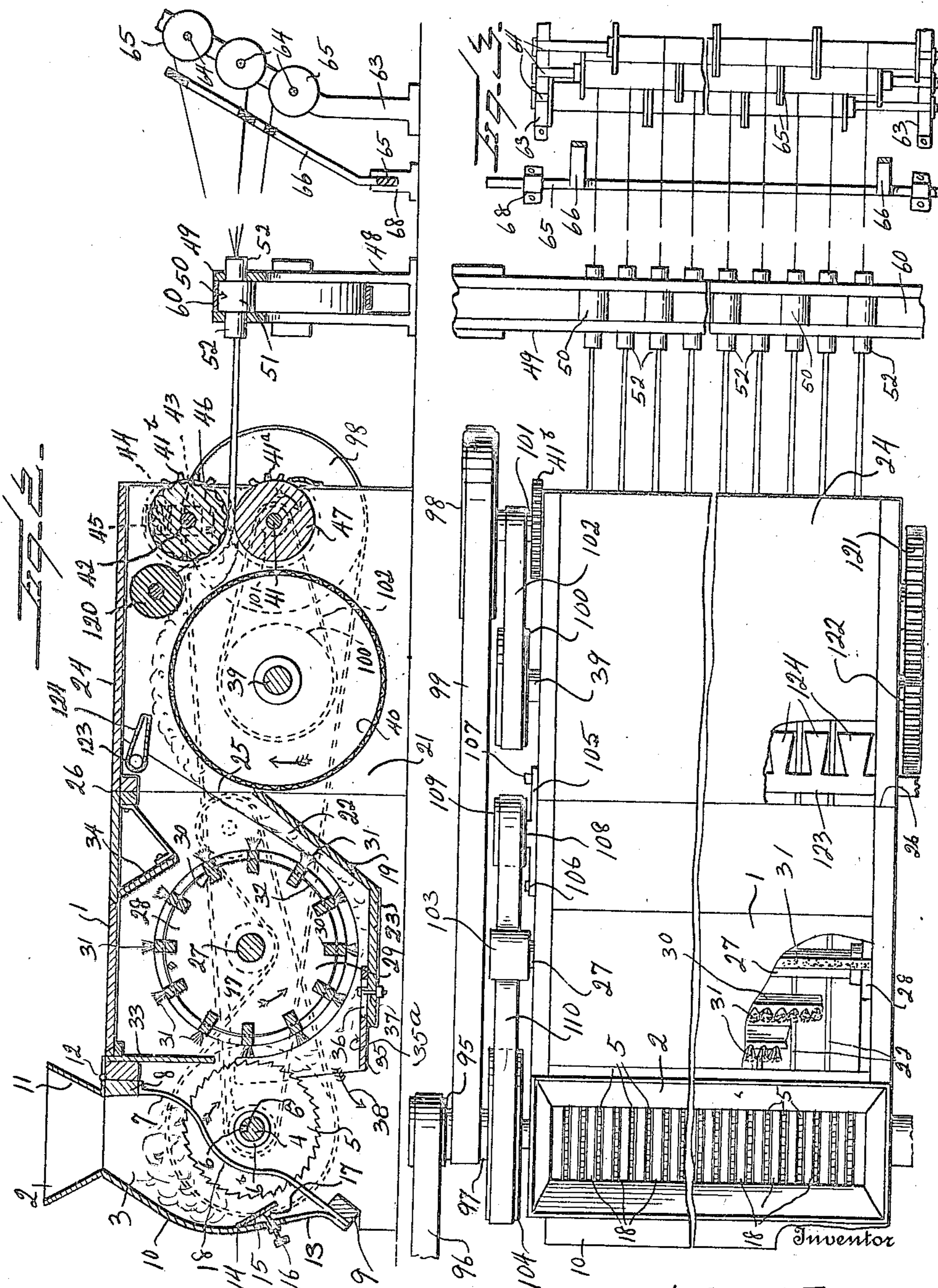
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3 SHEETS-SHEET 2



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3 SHEETS-SHEET 3

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UNITED STATES PATENT OFFICE.

LELAND L. FOSS, OF PULASKI, GEORGIA.

COTTON-ROPING GINNING MACHINE.

Application filed March 12, 1921. Serial No. 451,753.

To all whom it may concern:

Be it known that I, LELAND L. FOSS, a citizen of the United States, residing at Pulaski, in the county of Candler and State of Georgia, have invented certain new and useful improvements in Cotton-Roping Ginning Machines, of which the following is a specification, reference being had to the accompanying drawings.

10 The purpose of the present invention is to provide a machine for preparing seed cotton as it leaves a feeder and cleaner prior to being sized and spun, and it is obvious that after the cotton is sized and spun, it is then
15 ready for the loom.

It is another purpose to provide a machine of this general character, wherein the seed cotton is first acted upon by the ginning saws, from which the cotton is brushed by
20 means of a cylinder brush and fed through channels, then passed over a condensing screen roller, and subsequently between lint rollers (which may or may not be corrugated as may be found desired), and then fed
25 through a twisting or condensing head, and subsequently guided upon series of spools or reels in the form of cotton roping, which is then ready for the sizing and spinning process, and afterwards to be fed to the loom.

30 Still another purpose involves channels, troughs or guides or passages conforming to the brush roller and the condensing screen roller, to receive the cotton and contract the battings, particularly as the battings pass
35 over the lint rollers, so that the contracted batting may pass through and be condensed by the twisting head, sufficiently to form into temporary twisted slivers or roping.

40 It is a further purpose to provide means for driving the various parts or mechanisms of the machine automatically from a single source.

A still further purpose consists in the provision of a machine, wherein means is provided for governing the discharge of seed,
45 which may discharge from the seed cotton while in the ginning chamber, and also means for taking care of the mote and trash, which may leave the cotton as it is brushed
50 from the ginning saws.

Additionally it is the aim to provide a plurality of revoluble spools or reels superimposed in axially aligned rows, automatically driven, to receive the cotton roping as
55 it leaves the twisting head.

It is well known that the passing of a batting or sliver through the spindles or twisting head after leaving delivery rollers will not receive a permanent twist with the spindles travelling about the battings or slivers
60 as their axes, when the receiving rolls or reels do not revolve on an axis in alignment with the slivers. This is true due to the fact that the twisting effect is entirely nullified by the time the battings or slivers reach the
65 reels or rolls. However the only permanent result being that the fibres of the slivers or battings have become more interadherent in consequence of the compression produced by the twist. Therefore the invention further
70 aims to provide sizing or reducing plugs for the rotating spindles of the twisting head for governing the diameter of the roping or slivers as they leave the lint or delivering
75 rolls. The fibres of the battings or slivers in passing through the passages of the rotating spindles of the twisting head receive a temporary twist, and in producing the same, the fibres become more interadherent as a
80 result of the compression produced by the twist. Therefore in many respects the co-operation of the twisting head and the receiving rolls or reels greatly resembles the continuous spinning frame, used for fine
85 spinning of carded slivers.

Also it is the aim to provide means for actuating the spindles of the twisting head in unison, in order to impart a uniform condensing action to the cotton roping.

While the design and construction at present illustrated and set forth is deemed preferable, it is obvious that as a result of a reduction of the invention to a more practical form for commercial purposes, the invention may be susceptible of changes, and
95 the right to these changes is claimed, provided they are comprehended within the scope of what is claimed.

The invention comprises further features and combination of parts, as will be hereinafter set forth, shown in the drawings and claimed.

In the drawings:—

Figure 1 is a view in side elevation of the improved cotton roping ginning machine
105 constructed in accordance with the invention.

Figure 2 is a longitudinal sectional view through the same.

Figure 3 is a plan view of the machine. 110

Figure 4 is a view in elevation of the guiding means for guiding and feeding the cotton roping onto the spools or reels.

Figure 5 is a detail view of one side of the frame for the support of the spools or reels, showing the means for retaining the shafts of the spools or reels in bearings of the sides of the frame.

Figure 6 is a view in elevation of the twisting head, showing the operating means for the spindles thereof.

Figure 7 is a detail view in side elevation of the support or reel frame, showing the means for operating the reels or spools, with the upper drive pulley for said means (not shown).

Figure 8 is a detail sectional view of several of the spindles of the twisting head, showing a series of sizing plugs.

Figure 9 is an enlarged detail view in section showing a modified construction of ginning chamber with the brush cylinder dispensed with, and in lieu thereof pneumatic means being employed for taking the cotton lint from the saws and passing it through the several passages, ducts or chambers and over the condensing screen drum or roller.

Figure 10 is a detail perspective view of one of the partitions 22, thereby showing the cut away portion 35^a.

Referring to the drawings, 1 designates a casing, which may be any suitable shape or configuration, preferably as shown and constructed of any suitable material. Mounted on one end of the frame is a suitable hopper 2, for receiving the seed cotton, as it leaves the combined cleaner and feeder (not shown). The same end of the frame is provided with the ginning chamber 3, in which the seed cotton passes, and mounted in suitable bearings of the sides of the frame is a driving shaft 4, on which a plurality of ginning saws 5 is arranged. It is obvious that any number of saws may be employed. In fact the machine may be constructed to employ, one, two or three saws, preferably a large number of saws as disclosed in Figure 3. Arranged between the saws are ribs 7, which alternate with the saws, and have their upper portions fastened at 8 in any suitable manner to the frame of the machine. The upper ends of the ribs are fastened to a beam 9, which also has secured thereto the lower portion of the wall 10 forming the ginning chamber proper 3.

The lower portion of the wall 10 of the ginning chamber has an opening 13 and hingedly mounted on the wall as at 14 is a seed governor 15 threaded through the wall 10 of the ginning chamber is an adjusting screw 16, which is in turn swivelled at 17 to the seed governor, which controls the seed, which discharges from the seed

cotton as it revolves in the ginning chamber. The ribs or bars 7 between the saws are curved as indicated at 18 to conform substantially to the contour of the saws. These ribs or bars act to retain the seed cotton or lint in the ginning chamber.

The governor 15, when adjusted toward the teeth of the saw, act to thoroughly clean the lint from the seed. Obviously when the governor is adjusted away from the teeth of the saws, considerable of the lint passes through the chamber on the seed.

Arranged in the frame or casing adjacent its lower portion is a partition 19, thereby dividing off a brush roller receiving chamber 20. This partition includes an upwardly inclined portion, which also divides the casing or frame into a condensing screen roller or cylinder chamber 21.

Mounted on the partition 19, which is horizontally disposed, are partitions 22, which are arranged in spaced relation, to provide cotton or lint receiving passages 23. The partitions 22 extend from adjacent to and between the saws over the surface of the partition 19, and are connected in any suitable manner at 24 to the upper wall of the frame. The partitions 22 are separable as at 25, since the frame or casing is likewise separable as at 26. In other words that portion of the frame or casing which contains the condensing roller or cylinder and the lint rollers is detachable from that portion of the frame which contains the brush roller or cylinder. Obviously when the machine is in operation the two sections of the frame are attached in any suitable manner (not shown).

Journalled in suitable bearings of the sides of the frame or casing is a shaft 27, on which a brush cylinder or roller 28 is mounted. This cylinder comprises disks 29, which are connected by the bars 30. These bars are inset into the edge portions of the disks, and carry brushes 31. The bars are held in the edge portions of the disks by means of wire 32, which wraps around the outer edges of the bars. The partitions 22 are curved as shown, in order to conform to the contour of the cylinder.

An abutment or deflector 33 depends from the upper part of the frame, and is disposed in close position to the saws, to prevent the lint or cotton from being thrown from the brush cylinder. A similar deflector or abutment 34 is disposed in an inclined position over the brush cylinder to prevent the best portion of the lint which may stick to the brush cylinder from being carried around with it.

A mote board 35 is mounted upon the partition 19, and is provided with a slot 36, through which bolts 37 engage, to hold the board in position. The lower ends of the bolts have nuts, by which the board may be

held in different adjusted positions. The mote and trash strike the board, and feed out of the brush containing chamber at the point indicated by the arrow 38.

5 Journaled in bearings of the frame is a shaft 39, with which a condensing screen roller or cylinder 40 is rotatable. These portions of the partitions 22 which connect to the upper part of the frame or casing, are
10 curved to conform to the contour of the condensing cylinder. The lower portions of the partitions where the mote board is mounted are cut away as at 35^a for the reception of the board, as may be obvious on an inspection of
15 Figure 7 of the drawings.

Arranged at one end of the frame of the machine are shafts 41 and 42. The lower shaft 41 is mounted in bearings of the frame while the shaft 42 is mounted in movable
20 bearings 43 mounted in guides 44 of the sides of the frame, there being springs 45, to hold the movable bearings 43 in engagement with the lower ends of the guides 44 of the sides of the frame. These shafts 42 and 41 carry
25 the upper and lower lint rollers 46 and 47. Preferably the upper roller 46 is corrugated, though it is obvious that either, or both may be corrugated.

Arranged in one end of the machine is an
30 arched frame 48, though it is obvious that any other suitable frame may be employed, and the upper part of this frame comprises the parallel bearing bars 49, in bearings of which cotton roping condensing spindles 50
35 are mounted. These spindles, as disclosed clearly in Figure 8, comprise the central portions 51 and the reduced end portions 52, which engage the bearings of the parallel bars 49. The ends of the frame 48 have
40 shafts 53 and 54. The shaft 53 is mounted in stationary bearings at one end of the frame, while the shaft 54 is mounted in movable slide bearings 55, which are guided in the openings 56, there being adjusting screws
45 or bolts 57, for moving the bearings 55 in the direction of the arrow *a*. The spindles 50 of the twisting head rotate on axes in alignment with the roping or slivers, and which act to impart a temporary twist to the roping
50 or slivers, it being obvious that the fibres thereof become condensed and more interadherent as a result of the compression produced by the twist, thereby producing slivers which resemble, in many respects, a finely
55 spun sliver or thread, as may be produced from a continuous spinning frame.

Pulleys 58 and 59 are carried by the shafts 53 and 54, and passing over these pulleys, and engaging the central portions of the
60 spindles 50 is a belt 60, which act to drive the spindles, obviously by adjusting the screws 57, it will be seen that the shaft 54 may be moved in the direction of the arrow *a*, thereby tightening the belt 60, and thereby insuring

imparting revoluble movements to the condensing spindles.

The spindles 50 further comprise tapering openings 61, through which the cotton roping passes, as it leaves the lint rollers. The cotton roping enters the larger ends of the
70 tapered openings, and leave the spindles at the smaller ends of the openings. Sizing or condensing plugs 62 are threaded into certain ends of the spindles, for the purpose of additionally reducing the smaller ends of the
75 openings 61, whereby the cotton roping may be considerably condensed or contracted, before it passes onto the spools or reels.

Spool or reel supporting frame 63 is provided, and journaled in bearings thereof is a
80 plurality of shafts 64, on which spools or reels 65 are journaled. These spools or reels are super-imposed on a plane inwardly inclined in a direction away from the points of the spindles of the twisting head. These
85 reels or spools are disposed, to receive the cotton roping as the roping leaves the spindles of the twisting head. In order to guide the cotton roping upon the spools or reels, a suitable guide frame 66, shown in elevation
90 in Figure 4 is provided. This frame 66 comprises the base bar 67 mounted to reciprocate in the guides 68. The frame 66 rises upwardly from the bar, and is provided with a plurality of transversely disposed bars 69
95 having openings 70, through which the cotton roping pass, and from which the roping extends toward and upon the spools or reels.

The shafts 64 on which the spools or reels are mounted, have pulleys 71, and
100 mounted on one side of the frame 63 are upper and lower stub shafts 72 and 73 having pulleys 74 and 75. A belt 76 passes about the pulleys 74 and 75, and one side of the belt interlaces between and engages
105 the pulleys 71, so that when the shaft 72 is rotated, power may be transmitted to the spool or reel carrying shafts 64. An extra pulley 77 is mounted upon the shaft 72.

Journaled in suitable bearings 78 of a stationary base or the like on which the entire machine rest, is a shaft 79, and mounted on the shaft is a pulley 80, which is operatively connected with the pulley 77 by means of the belt 81. Obviously when the shaft 79 is
110 rotated, power is transmitted to the reel or spool carrying shafts 64. An eccentric 82 is operatively connected to the base bar of the guide frame 66, by means of the eccentric strap connecting bars 83 and 84. Obviously when the shaft 79 revolves, the eccentric 82 will impart a reciprocating movement to the base bar 67 and the shaft 66 and thereby guide the cotton roping upon the reels or spools which are correspondingly
115 rotated by means of the shaft 79.

The shafts 53 and 79 carry cone pulleys 85 and 86 connected by means of the strap 87,

therefore when the shaft 79 is rotated, the shaft 53 of the twisting head will correspondingly rotate, therefore impart movement to the spindles. The shaft 53 is also mounted in one of the bearings 78. A pulley 88 is also carried by the shaft 79, and mounted in bearings below the base on which the entire machine rest is a counter-shaft 89 having pulleys 90 and 91. The pulley 90 is connected to the pulley 88 by means of the belt 92, while the pulley 91 is operatively connected to the shaft 4 by means of the belt 93.

One end of the shaft 4 has mounted thereon a pulley 95, to which power from any suitable source (not shown) is connected by means of a belt 96, so as to transmit motion to the shaft 4, which in turn imparts movement to the various other moving elements.

The shafts 4 and 41 are operatively connected by means of the pulleys 97 and 98 and the belt 99. The shafts 39 and 41 are operatively connected by means of the pulleys 100 and 101 to the belt 102.

The shaft 27 carries a pulley 103, and a pulley 104 is also carried by one end of the shaft 4. A suitable bearing strap 105 is pivoted at 106 to one side of the frame of the machine and carries a set screw 107, for holding the bearing strap 105 in different adjusted positions. This bearing strap carries a stub shaft 108, which carries a pulley 109. A belt 110 operatively connects the pulleys 104 and 109, and one side of the belt engages under the pulley 103, so that power may be transmitted to the brush cylinder, which is designed to rotate very rapidly, approximately two thousand revolutions a minute, while the condensing cylinder is designed to revolve substantially fifteen revolutions a minute.

In the operation of the machine, the cotton to be cleaned passes through the hopper 2 in the form of seed cotton, and then into the ginning chamber, where the ginning saws gather the cotton from the seed cotton, and it is then brushed from the teeth and fed through the channels caused to be formed by the partitions 22. The cotton passes through the channels, and then over the condensing cylinder, and then between the lint rollers, from which the battings pass through the spindles of the twisting head. The battings pass from the smaller ends of the spindles and then upon the spools or reels, and after the reels or spools are filled, the battings are then ready for spinning purposes, after which it is fed to the looms (not shown).

The purpose of the twisting head in this construction of device is to provide means for producing a condensing action on the slivers or battings, greatly resembling the continuous spinning of certain textile fibres (in particular carded wool). In fact the

present invention has to do with giving the sliver between the receiving and delivering rollers a temporary twist, causing the fibres to become more adherent as a result of the compression of the temporary twist and delivering action from the spindles of the twisting head to the receiving rollers.

By means of the present apparatus, a continuous drawing and condensing action of the slivers are obtained and the twist is given to the whole of the lengths of the slivers between the points of contact with the receiving reels and the delivering or lint rollers, the said twist being temporary.

The upper shaft 72 as shown in Figure 7 is mounted in sliding bearings 111, which are mounted in guides 112, there being adjusting screws 113 swivelly connected to the bearings 111, for not only tightening the belt 76, but also tightening the belt 81.

The upper part of the chamber includes a transverse bar 11, with which the hopper 2 is movable. The wall 10 is also movable with the hopper, which is hinged at 12, permitting the hopper and the wall 10 and the ribs to be lifted, so as to have access to the saws.

In Figure 9 it will be noted that the cylinder brush is eliminated, and in lieu thereof suitable blast pipes 114 are employed for blowing the cotton or lint from the teeth of the saws. This pipe has an outlet end, which is cut away or slotted, as indicated at 115, to receive the edge portions of the saws. A blast pipe 116 extends transversely of the frame and is provided with a plurality of branch nozzles 117, directing jets of air through the passages between the partitions 22, so as to blow the cotton toward and from the condensing cylinder.

The shafts 64 are mounted in notches or bearings 63^a of the sides of the frame 63, there being holders 63^b pivoted at 63^c, to hold the shafts in their bearings. The holders also have fasteners 63^d to retain the holders in position.

The shafts 41 and 42 gear together by the intermeshing gears 41^a and 41^b. The upper lint roller 46 yields incident to the cotton or lint passing between the two rollers.

While the drawings disclose two saws to every channel or passage way between the partitions 22, it is obvious, that one, two, three or four or any number of saws may be used between the partitions. If only one saw is used between each partition, the batting passing between the partitions will be relatively small, and if the number of saws between two adjacent partitions are increased, the size of the batting is relatively increased. It is the aim to not limit the arrangement of the partitions and the saws relatively to each other, to any particular construction, just so long as certain saws are

arranged coincident to the passages between the partitions.

Furthermore the ginning saws are mounted upon the shaft 4, and are rotatable therewith, by means of keys 6 engaging key way 6^a of the shaft, there being collars 6^b between the saws, to hold the saws spaced. The ends of the shaft are provided with suitable means, such as jam nuts, to hold the saws on the shaft, and to hold the saws and the collars close together, so as to prevent the lint from clinging between the parts.

In order to assist the battings through the passages between the guides, particularly at points where they pass between the lint rollers, an additional feed roller 120 is journaled in the frame, in the rear of the roller 46, so as to feed the battings between the lint rolls. This feed roller 120 is driven by a gear 121, meshing with a gear 122, which is mounted on the shaft 39. In order to assist the battings in their travel over the condensing screen roller, a suitable air blast pipe 123 enters the side of the frame or casing, and is provided with a plurality of jets 124, located between the partitions at points above the battings as they pass over the condensing roll, directing the air toward the battings and feeding them over the condensing roll.

The flooring on which the machine rests, is provided with a suitable opening, to carry off the supply of air, created by the cylinder brush, and created by the blast 123.

The present form of apparatus embodies a structure for making cotton roping, which after being sized and spun, is then ready for the loom. The present machine is also designed for ginning cotton in place of baling the same, and then it is carded into cotton batting by means of a carding machine. It is then twisted into roping, which can all be accomplished while at the gin, and as the cotton batting comes from the saws, The cotton batting is brushed between the partitions which divide the lint into small battings, it being possible to use one, two, three or four or any number of saws as may be desired, to each passage between any two partitions. The cotton battings then pass through the hollow spindles of the twisting head, the same being drawn therethrough by the revolving spools, while the spindles are turning, for the purpose of condensing the battings.

The invention having been set forth, what is claimed as being useful is:

1. In a machine for the purpose set forth, a frame having a ginning chamber for the seed cotton, ginning saws in said chamber, a seed governor mounted on the wall of the ginning chamber for adjustment toward and from the teeth of the saws for controlling the seed discharging from the seed cotton, a cyl-

inder brush mounted in the frame, a condensing cylinder mounted in the frame, and passages extending from between the saws under the brush and over the condensing saw, and lint rollers to receive the battings of cotton as it leaves the condensing cylinder.

2. In a machine for the purpose set forth, a frame having a ginning chamber for the seed cotton, ginning saws in said chamber, a seed governor mounted on the wall of the ginning chamber for adjustment toward and from the teeth of the saws for controlling the seed discharging from the seed cotton, a cylinder brush mounted in the frame, a condensing cylinder mounted in the frame, and passages extending from between the saws under the brush and over the condensing saw, and lint rollers to receive the battings of cotton as it leaves the condensing cylinder, means for condensing or reducing the battings.

3. In a machine for the purpose set forth, a frame having a ginning chamber for the seed cotton, ginning saws in said chamber, a seed governor mounted on the wall of the ginning chamber for adjustment toward and from the teeth of the saws for controlling the seed discharging from the seed cotton, a cylinder brush mounted in the frame, a condensing cylinder mounted in the frame, and passages extending from between the saws under the brush and over the condensing saw, and lint rollers to receive the battings or cotton as it leaves the condensing cylinder, means for condensing the battings, and means for receiving the battings after condensing the same.

4. In a machine for the purpose indicated, a casing having a ginning chamber, ginning saws in said chamber, said casing having a second chamber, a cylinder brush in the second chamber for removing the cotton from the saws, a plurality of partitions extending under and conforming to the brush and being spaced in parallelism, thereby dividing the bottom of the second chamber into passages for receiving and contracting the cotton, the lower portions of the partitions being cut away, and a mote board engaging the cut away portion and adjustably connected to the bottom of the second chamber for guiding the motes from the brush whereby they may discharge below the saws.

5. In a machine for the purpose indicated, a casing having a ginning chamber, ginning saws operable in said chamber, said casing having a second chamber adjacent the ginning chamber, partitions on the bottom of the second chamber and spaced to form passages to receive the cotton from the saws, a cylinder brush in the second chamber and to the contour of which the partitions conform, said brush adapted to remove the cotton from the saws and feed it through the

passages, and a mote board mounted on the bottom of the second chamber below and to one side of one of the saws to guide the motes from the passages below the saws.

5 6. In a machine for the purpose indicated, a casing having a ginning chamber, a ginning mechanism therein including ginning saws, said casing having a second chamber having its bottom below and to one side of
10 the ginning saws, the bottom of the second chamber at its rear portion being inclined upwardly, partitions on the bottom and being spaced to provide passages for the cotton from the saws, a cylinder brush to re-
15 move the cotton from the saws and feed it through the passages, a mote board on the bottom below and between the saws and the cylinder brush, and abutment means approximately above the brush and substantially
20 diametrically opposite the mote board to prevent the best portion of the lint from being carried around on the brush.

7. In a machine for the purpose indicated, a casing having a ginning chamber, a gin-
25 ning mechanism therein including ginning saws, said casing having a second chamber having its bottom below and to one side of the ginning saws, the bottom of the second chamber at its rear portion being inclined
30 upwardly, partitions on the bottom and being spaced to provide passages for the cotton from the saws, a cylinder brush to remove the cotton from the saws and feed it through the passages, a mote board on the
35 bottom below and between the saws and the cylinder brush, and abutment means approximately above the brush and substantially diametrically opposite the mote board to prevent a certain portion of the lint from
40 being carried around on the brush, a second casing including a chamber, a condensing screen cylinder in the chamber of the second casing, partitions above the condensing cyl-
45 inder and spaced in alignment with the first partitions, whereby the cotton may feed over the condensing cylinder, lint rollers for receiving the battings of cotton passing from the condensing cylinder, and pneumatic means including a plurality of jets extend-
50 ing between the second partitions for feeding the battings over the condensing cylinder.

8. In a machine for the purpose indicated, a pair of casing sections, one having a pair
55 of chambers, one of said chambers including a ginning mechanism having ginning saws, means including a cylinder brush for removing the cotton from the saws, the bottom of said second chamber having passages con-

forming to the cylinder brush for receiving 60 the cotton from the saws, the other casing section having a chamber, a condensing cylinder in the last mentioned chamber, said last mentioned chamber having passages ex- 65 tending over and conforming to the condensing cylinder, the first mentioned passages having portions inclined upwardly toward the upper portion of the condensing cylinder, means for connecting the two cas- 70 ing sections whereby the upwardly inclined portions of the first mentioned passages may register with the passages extending over the condensing cylinder, pneumatic means in- 75 cluding air jets extending into the second mentioned passages for feeding the cotton over the condensing chamber, and lint rollers to receive the battings of cotton from the condensing cylinder.

9. In a machine for the purpose indicated, a casing comprising two casing sections, one 80 of said sections having two chambers, a ginning mechanism in one of said chambers, means including a cylinder brush in the other chamber to gather the cotton from the ginning mechanism, the bottom of the sec- 85 ond chamber having passages conforming to and extending under the cylinder brush and extending upwardly beyond the brush, the second casing section having a chamber, a condensing cylinder in the last mentioned 90 chamber, the upper part of the last mentioned chamber having passages extending over and conforming to the condensing cylinder and registering with the upwardly in- 95 clined portions of the first passages, and pneumatic means for feeding the cotton through the second mentioned passages, lint rollers between which the cotton battings from the condensing cylinder pass, and means for receiving and condensing the cot- 100 ton battings as they leave the lint rollers.

10. In a machine for the purpose indicated, a twisting head comprising a frame, rotatable and movable shafts mounted in bearings on the ends of the frame, one of 105 said shafts being adjustable pulleys on said shafts, a belt engaging said pulleys, a plurality of spindles arranged in parallelism and mounted in bearings of the sides of said frame, said spindles being spaced, whereby 110 the upper portion of the belt may pass alternately over and under said spindles for rotating the same, means for tightening the belt.

In testimony whereof I hereunto affix my 115 signature.

LELAND L. FOSS.