Dec. 5, 1950 T. S. RAMSDELL 2,532,330

EVENER FOR COTTON PICKERS

Filed Feb. 15, 1945 3 Sheets-Sheet 1

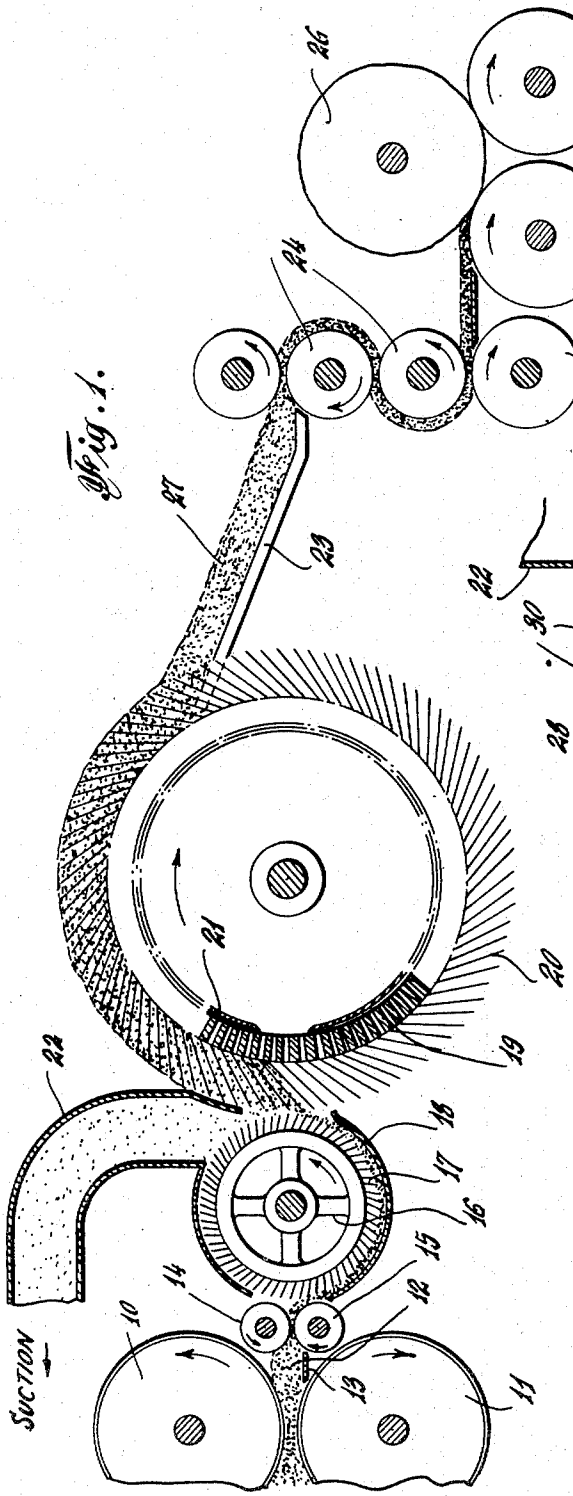


Fig. 1.

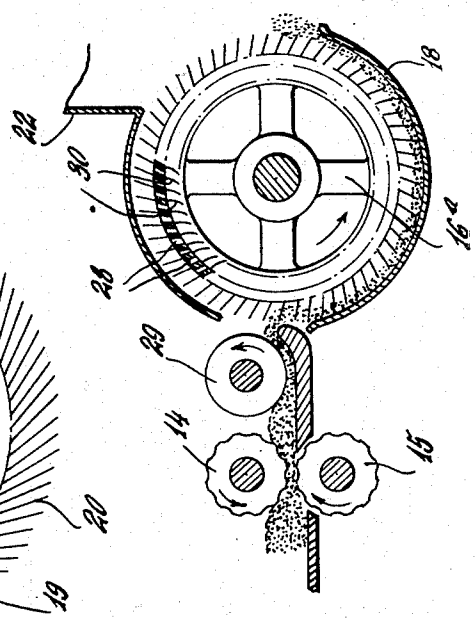


Fig. 2.

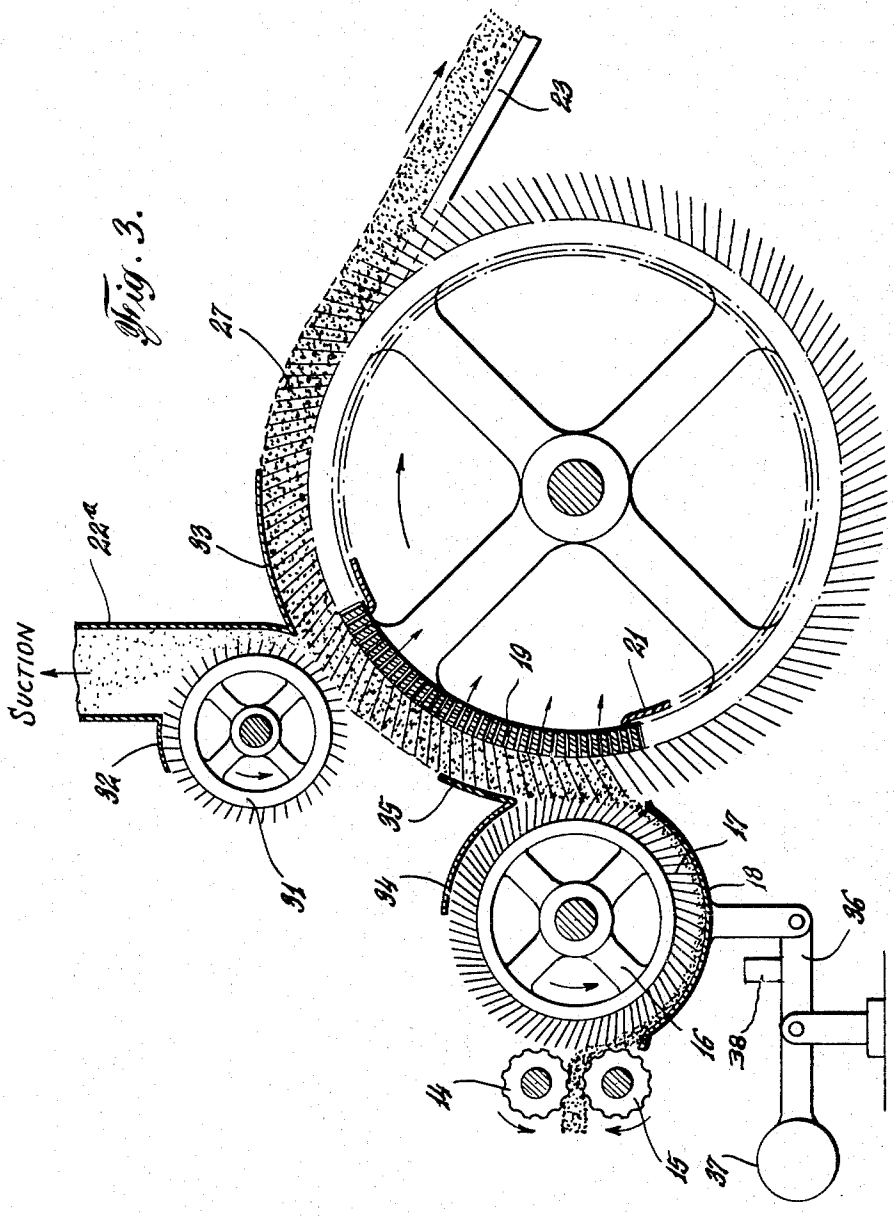
INVENTOR.
Thomas S. Ramsdell
BY
Fraser, Myers & Manley
ATTORNEYS

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Fig. 3.



INVENTOR.
Thomas S. Ramsdell
BY
Fraser, Myers & Manley,
ATTORNEYS

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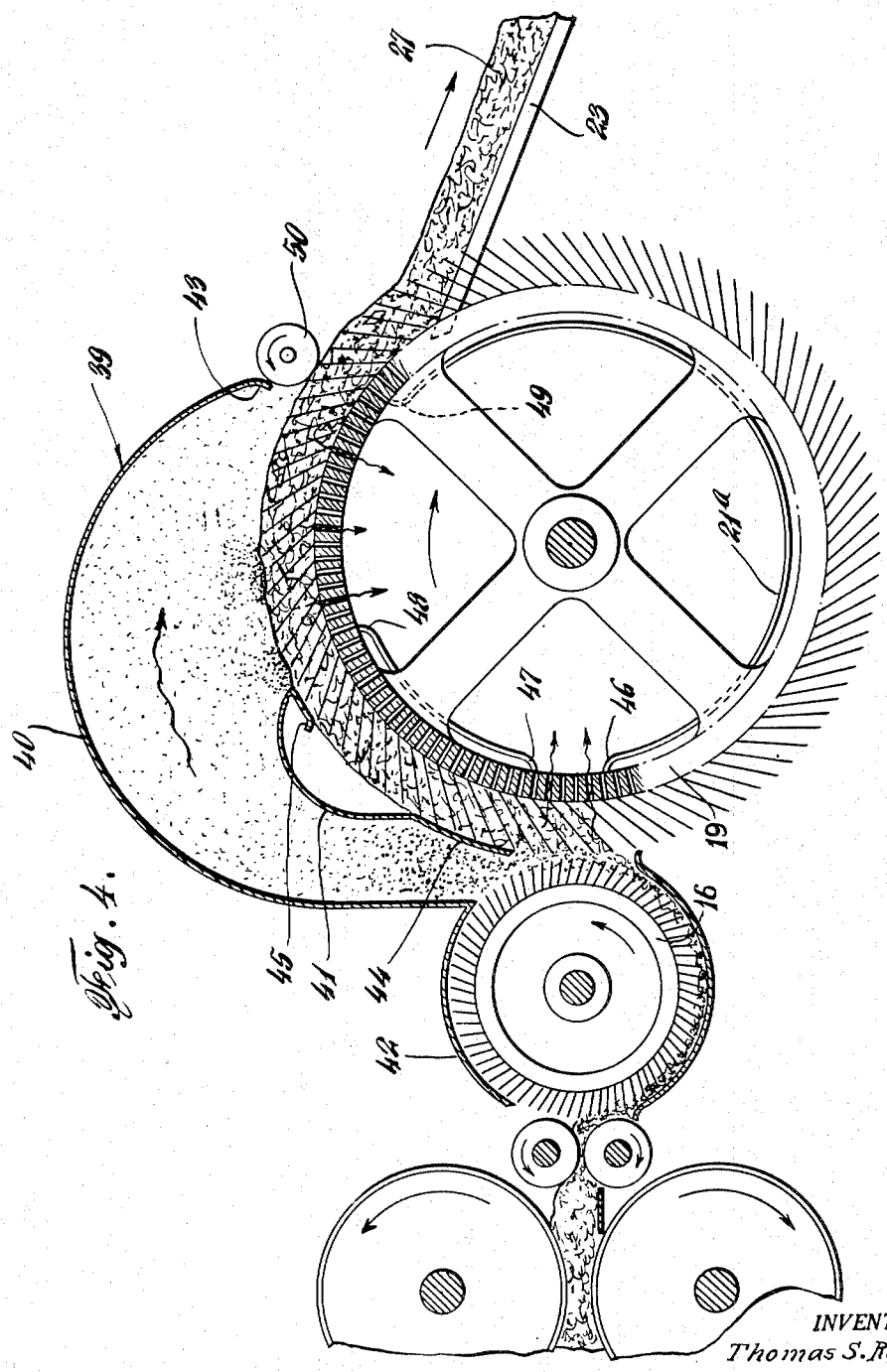


Fig. 4.

INVENTOR.
Thomas S. Ramsdell

BY
Fraser, Myers & Manley.
ATTORNEYS

Patented Dec. 5, 1950

2,532,330

UNITED STATES PATENT OFFICE

2,532,330

EVENER FOR COTTON PICKERS

Thomas S. Ramsdell, Great Barrington, Mass.

Application February 15, 1945, Serial No. 577,964

16 Claims. (Cl. 19—156)

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My present invention relates to an evener for cotton pickers and is intended to supplement those now in common use. More particularly it relates to a method of and means for forming a substantially homogeneous picker lap.

Conventional eveners now in use on picker calender machines, it is generally recognized, provide only partial control so far as concerns the uniformity of the produced lap and can not be considered as sensitive governors for said purpose. In fact, such eveners are inclined to be sluggish in action and are without any effect on the control of crosswise uniformity of the produced lap. This fact is borne out through observation of the cotton as it leaves the beater and is carried by the swirling current against the wire cages with the result that the lap is carried to the calender with heterogeneously disposed thick and thin areas in it. Such a lap can only result in the production of an unevenly carded web since the substantial further reduction in the thickness of the lap in the course of being processed through the carding machine must of necessity proportionally reduce the thickness of the heterogeneous thick and thin areas.

My present invention contemplates the provision of a method and means whereby a more homogeneous lap, both longitudinally and crosswise of the picker lap, will be produced. To accomplish this, the lap, as it comes from the picker, is acted upon by a rapidly rotating cylindrical drum coated with pins and somewhat resembling a licker-in roller, which provides a combing and thinning action upon the delivered web, which thinned web is then transferred, preferably with the aid of slight pressure and/or centrifugal action, onto and between the pins of a slowly moving condensing cylinder where the cotton will accumulate and build up in thickness without undue packing. Where there are unusually thick portions of the sheet, the surplus will be either fanned or brushed off and returned by suction to the rear of the picker for re-processing or it may be carried in a fine spray within a hood over the condensing cylinder and be deposited over any thin places on the fibrous deposit already condensed thereon. The substantially even deposit of cotton on the condensing cylinder is then stripped therefrom as a lap and fed to calender rolls and wind-up rolls to provide a lap roll for processing by the carding machine.

The invention will be better understood from the detailed description which follows, when considered in connection with the accompanying

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drawings showing several embodiments, and wherein:

Figure 1 diagrammatically shows, in section, the elements of one embodiment of my invention arranged at the front of a picker.

Fig. 2 is a view similar to Fig. 1 showing a modification of certain of the elements shown in Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing a further embodiment of my invention.

Fig. 4 is a view similar to Fig. 1 showing still another embodiment of my invention.

Referring first to Fig. 1 of the drawings, the reference numerals 10 and 11 indicate the wire cages at the front end of a picker (not shown), which cages deliver a lap 12 formed by the picker over a supporting strip 13 to a pair of feed rollers 14 and 15 to a rapidly rotatable cylindrical drum 16 having circumferential rows of outwardly projecting pins 17. Supported in any convenient manner below the cylindrical drum 16 and in closely spaced relation thereto is an arcuate apron 18. Mounted in parallel relation to the drum 16 is a slowly rotatable perforated condensing drum 19 which rotates at a much slower rate than the drum 16, the exterior of the drum 19 being provided with pins 20, the outer ends of which are disposed substantially tangentially to the outer ends of the pins on the drum 16. This substantially tangential relation may be one wherein the outer ends of the pins on the respective drums are slightly spaced apart at their line of tangency, are truly in tangential relation or are in slightly overlapping relation. Fixedly mounted within the drum 19 is an arcuate baffle or damper 21, the longitudinal edges of which are spaced apart adjacent the line of tangency between the drums to provide an open area, for a purpose which will presently be explained. Disposed in overlying relation to the drums 16 and 19 above the line of tangency therebetween is a hooded conduit 22 which preferably extends to the rear of the picker. Suction force is applied to the conduit for a purpose which will be presently explained. Engaging between the circumferential rows of pins on the condensing drum at a point 90° or more beyond the line of tangency between the drums are the teeth of a stripper comb 23 which is adapted to strip the deposited fibers from the condensing drum and conduct them through calender rolls 24, from which they are fed to wind-up rolls 25 to produce a lap roll 26.

The rapidly rotating pinned cylindrical drum 16 in acting upon the lap 12 fed thereto, operates to pick and substantially reduce the thick-

ness of said lap and carry the same around over the arcuate apron 18 to the more slowly rotating condensing drum 19. The slowly moving pinned surface of the condensing drum 19 will absorb, without undue packing, a given amount of the cotton fibers, and where there are unusually thick portions of the sheet as they pass through the feed rolls 14 and 15 and form correspondingly heavy areas in the web of reduced thickness carried around the apron 18, the surplus will be sucked or fanned off by the suction action provided by the conduit 22 and returned to the rear of the picker for re-processing. The centrifugal force created by the rapidly rotating picking and thickness reducing drum 16 will aid in transferring the fibers of the web of reduced thickness from said drum to between the pins of the condensing drum. The condensing drum, on the other hand, may also be subjected on its interior surface to a suction action in a conventional manner, which suction acting across the open area between the ends of the damper 21 will aid in depositing the fibers upon the surface of the condensing drum between the pins thereof. The relative speeds of the drums 16 and 19 are so related that the web of reduced thickness carried by the former will be transferred to the latter, whereon it will accumulate and build up in thickness without undue packing and the fibers in excess of those required to form a deposit of uniform depth on the condensing drum will be carried off through conduit 22 by the suction action thereof. The substantially uniform deposit of fibers on the condensing drum 19 is then stripped or combed off by the stripper comb 23 to provide a lap 27, which is then compacted as it passes through the calender rolls 24, after which it is wound up to form the lap roll 26.

In Fig. 2 of the drawings I have shown an idler pressure roll 29 interposed between the feed rolls 14, 15 and the cylindrical picking and thickness reducing drum. I have also shown in said figure a modified form of picking and thickness reducing drum 16a which is perforated throughout its periphery, as indicated at 28, and the interior surface of the drum is provided with spaced blades or fins 30 which, during the rapid rotation of the drum, create an air pressure or fanning action directed outwardly of the drum which acts upon the web of reduced thickness at the line of substantial tangency between the picking and thickness reducing drum and the condensing drum to blow or fan the web of reduced thickness from the drum 16 onto and in between the pins on the drum 19. Except for the supplemental blowing or fanning action of the web of reduced thickness from the drum 16a to the drum 19 by the air currents created by the vanes 30, the action of this modification of my invention is substantially the same as that disclosed in Fig. 1.

In the modification of my invention shown in Fig. 3, instead of relying solely upon the action of the suction means disposed above the drums along their line of tangency for removing the fibers in excess of those required to form a deposit of uniform depth, the drums 16 and 19 are so mounted relatively to one another that the ends of the pins thereon are in slightly overlapping relation along the line of tangency of the drums. In view of this arrangement the fibers are physically transferred from the picking and thickness reducing drum 16 to the condensing drum 19. In this embodiment of my invention no means are provided at the line of substantial

tangency for controlling the depth to which the fibers will be deposited on the condensing drum. However, in order that the lap formed on the condensing drum and to be removed therefrom for processing through the calender rolls may be substantially homogeneous, I have provided a pinned brush roll 31 so set in relation to the pins on the condensing drum as to brush from said pins the fibers in excess of the predetermined thickness of the lap 27 to be stripped from the condensing drum. The fibers brushed off by the roll 31 are carried away by suction through a duct 22a and returned for re-processing at the rear of the picker. Suitable shields 32 and 33 may be attached to the duct 22a to overlie the brush roll 31 and the pins of the condensing roll 19, respectively, to promote the suction effect at the desired point of brushing. Additional shields 34 and 35 may be disposed over the drums 16 and 19, respectively, over the line of tangency therebetween.

Sometimes a large lump of cotton or some foreign substance is apt to pass through the feed rolls 14, 15 and find its way between the pins of the drum 16 and the apron 18 and create undue pressure therebetween. To relieve such pressure the arcuate apron 18 may be pivotally supported by one end of a pivoted lever 36, the other end of which carries a counterweight 37. To maintain a predetermined clearance between the apron 18 and the pins of roll 16 a fixed stop or bumper 38 may be used.

In the embodiment of my invention shown in Fig. 4, instead of returning the fanned or brushed off fibers to the rear of the picker for re-processing as hereinbefore described, I provide a substantially U-shaped hood 39 over the condensing drum 19 with one end of said hood overlying the line of tangency between the cylindrical drum 16 and the condensing drum 19. The hood 39 has outer and inner walls 40 and 41, respectively, one end 42 of the outer wall overlying the cylindrical drum 16 and the other end 43 of the outer wall terminating in spaced relation to the condensing drum 19 in proximity to the lap take-off portion thereof. The inner wall 41 of the hood at one end 44 overlies, and preferably lightly bears upon the outer periphery of the condensing drum 19 for a short distance beginning from a line adjacent its line of tangency with the drum 16 and is then spaced from the drum 19 for a distance and is bent back at its other end, as shown at 45. The hood 39 is adapted to receive the surplus fibers which are fanned or brushed off from the cylindrical drum 16 and carry said fibers in a fine spray over the slowly rotating condensing drum 19 and deposit said fibers onto the thin areas of the fibers already contained on said drum. To accomplish this deposition of the surplus fibers on the condensing drum substantially in proportion to the suction action on the deposited lap and to provide for the flow of the surplus fibers in a fine spray, as described, the fixed baffle or damper 21a within the condensing drum 19, in addition to being cut away between the points 46 and 47 adjacent the line of tangency between drums 16 and 19, is also cut away between points 48 and 49 which underlie the open end of the hood which overlies the condensing drum. Bearing on the outer periphery of the condensing drum 19 adjacent the end 43 of the hood wall 40 so as to provide a substantial continuation of said wall into contact with the drum 19, is an idler roller 50 which bears against the end 43 of the hood wall.

From the foregoing detailed description it will be understood that the combing and thinning drum 16 may be set far enough from the feed rolls 14, 15 so that the combing action of the fed lap is very gentle. Also, the adjustment between the peripheries of the pin drums 16 and 19, in conjunction with the centrifugal force of the drum 16 tending to throw the cotton fibers from the periphery thereof onto the condensing drum 19, and/or the blowing or fanning action created by the blades 30, and/or the suction action provided on the interior of the drum 19 between the ends of the damper 21 can be so made as to insure the accumulation and building up in thickness of the fibers on the condensing drum without undue packing, so that, when subjected to the suction effect through the conduit 22, the combined brushing action of the brush roll 31 and suction effect through the conduit 22*a*, or the redepositing action as shown and described with respect to Fig. 4, the web delivered by the comb 23 to the calender rolls will be substantially homogeneous throughout its length and width.

Although I have shown and described various methods of and machines for providing a substantially homogeneous picker lap, it is to be understood that the specific steps of the methods and the specific apparatus disclosed are merely given by way of example and may be varied within the range of engineering skill without departing from the spirit of the present invention, as defined in the appended claims.

What I claim is:

1. The method of forming a substantially homogeneous picker lap, which method comprises subjecting a fibrous web as it comes from a picker to a picking and thickness reducing action to provide a web which is much thinner than that delivered by the picker, transferring without packing said thinned web to a condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means and mechanically removing and carrying off with the aid of suction the fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means.

2. The method according to claim 1 wherein the transferring without packing of the thinned web to the condensing means is supplemented by centrifugal force created by the means which carries the thinned web.

3. The method according to claim 1, wherein the transferring without packing of the thinned web to the condensing means is supplemented by air pressure.

4. The method according to claim 1 wherein the deposit of fibers of substantially uniform depth is then stripped from the condensing means and subjected to pressure to compact the web.

5. The method according to claim 1 wherein the removal of the fibers in excess of those required to form a deposit of substantially uniform depth includes the brushing off of such excess fibers from the condensing means.

6. The method according to claim 1 wherein the removed fibers are subsequently deposited by suction action on an advanced section of accumulated and built up fibrous web on the condensing means.

7. The method of forming a substantially homogeneous picker lap, which method comprises subjecting a fibrous web as it comes from a picker to a picking and thickness reducing action to provide a web which is much thinner than that delivered by the picker, transferring without packing said thinned web to a condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means and removing mechanically at the area of transfer of the thinned web to the condensing means the fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means, carrying off said removed fibers with the aid of suction and subsequently depositing by suction action said removed fibers on advanced sections of the accumulated and built up fibrous web on the condensing means substantially in proportion to the suction action on the deposited lap.

8. A machine for forming a substantially homogeneous picker lap which comprises, in combination, a picker and its cages, condensing means, means in front of the picker for feeding, picking and reducing in thickness the fibrous web delivered by the wire cages of the picker and feeding said thinned web to the condensing means, said condensing means being movable at a much slower rate than that at which the thinned web is fed thereto so that the web will accumulate and build up in thickness on said condensing means to several times the thickness of the thinned web, mechanical means cooperating with the condensing means for removing the fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means, and suction means for carrying off the fibers removed by the mechanical means.

9. A machine according to claim 8 wherein the mechanical means for removing the fibers in excess of those required to form a deposit of substantially uniform thickness on the condensing means includes a rotatable brush-like member mounted in substantially tangential relation to the surface of the condensing means.

10. A machine according to claim 8 wherein the picking and reducing in thickness means in front of the cages comprises a rapidly rotatable drum having its surface covered with circumferential rows of pins, an apron in spaced relation to the ends of the pins for guiding the thinned web which is movable with the pinned rotatable drum, wherein the condensing means is a rotatable drum having its surface covered with circumferential rows of pins, the ends of which are in substantially tangential relation to the ends of the pins on the first mentioned drum and wherein the means for carrying off the fibers in excess of those required to form a deposit of substantially uniform thickness on the condensing means is a suction device overlying the pinned drums along the line of substantial tangency thereof.

11. A machine for forming a substantially homogeneous picker lap which comprises, in combination with feed rolls disposed in front of the wire cages of a picker, condensing means, a rapidly rotatable perforated drum having its outer surface covered with outwardly directed pins adapted to pick and reduce the thickness of a web delivered by the feed rolls and carry such web of reduced thickness to the condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means, means for removing the

fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means, and means on the interior of the perforated pinned drum for creating air pressure acting outwardly of the drum to aid in transferring the fibers forming the web from the drum to the condensing means.

12. A machine according to claim 11 wherein the means on the interior of the drum for creating air pressure are a plurality of vanes extending inwardly from the inner surface of the drum.

13. A machine for forming a substantially homogeneous picker lap which comprises, in combination with feed rolls disposed in front of the wire cages of a picker, condensing means, a rapidly rotatable perforated drum having its outer surface covered with outwardly directed pins adapted to pick and reduce the thickness of a web delivered by the feed rolls and carry such web of reduced thickness to the condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means, means for removing the fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means, said condensing means comprising a rotatable perforated drum having its outer surface covered with outwardly directed pins, with the ends of said pins in substantially tangential relation to the pins on the first mentioned drum, a fixed damper covering the inner surface of the condensing drum, said damper being cut away adjacent the line of tangency between the drums, and suction means operating upon the interior of the condensing drum to aid in transferring the fibers forming the web on the first mentioned drum from said drum to the condensing drum.

14. A machine for forming a substantially homogeneous picker lap which comprises in combination with feed rolls disposed in front of the wire cages of a picker, condensing means, a rapidly rotatable perforated drum having its outer surface covered with outwardly directed pins adapted to pick and reduce the thickness of a web delivered by the feed rolls and carry such web of reduced thickness to the condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means, means for removing the fibers in excess of those required to form a deposit of substantially uniform depth on the condensing means, an arcuate apron disposed in underlying relation to the drum and over which apron the web of reduced thickness is movable with the pinned rotatable drum, said apron being supported by a counterweighted lever and being

movable away from the drum when subjected to excessive pressure.

15. A machine for forming a substantially homogeneous picker lap which comprises, in combination with feed rolls disposed in front of the wire cages of a picker, condensing means, a rapidly rotatable perforated drum having its outer surface covered with outwardly directed pins adapted to pick and reduce the thickness of a web delivered by the feed rolls and carry such web of reduced thickness to the condensing means moving at a much slower rate than that at which the web is fed thereto so that the web will accumulate and build up in thickness on said condensing means, said condensing means comprising a rotatable perforated drum having its outer surface covered with outwardly directed pins, with the ends of said pins in substantially tangential relation to the pins on the first mentioned drum, a fixed damper covering the inner surface of the condensing drum, said damper being cut away adjacent the line of tangency between the drums and for an arcuate distance in circumferentially spaced relation to said first cutaway portion, a hood disposed over the condensing drum, one open end of said hood overlying the line of tangency between the drums and the other end overlying the second cutaway portion of the damper, and suction means operating upon the interior of the condensing drum to aid in transferring the fibers forming the web on the combing and thinning drum from said drum to the condensing drum.

16. A machine according to claim 15 wherein the open end of the hood which overlies the second cutaway portion of the damper has its outer wall spaced from the condensing drum and wherein a roller is mounted to bridge said space and bear on the condensing drum.

THOMAS S. RAMSDELL.

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