

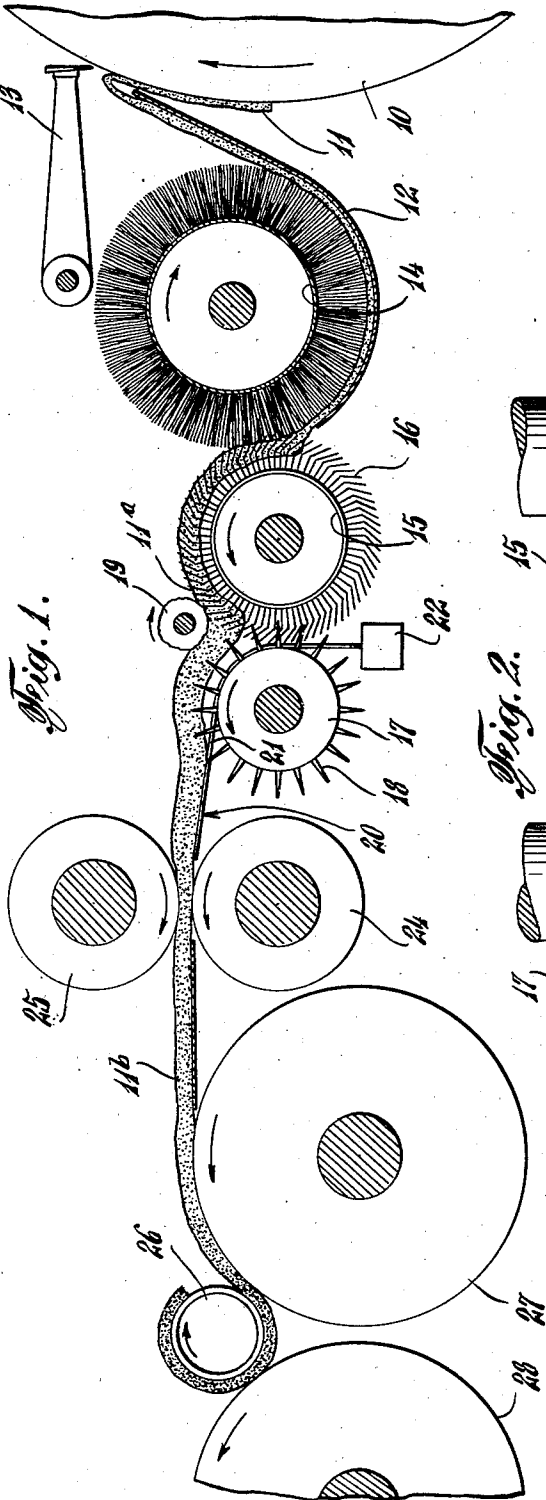
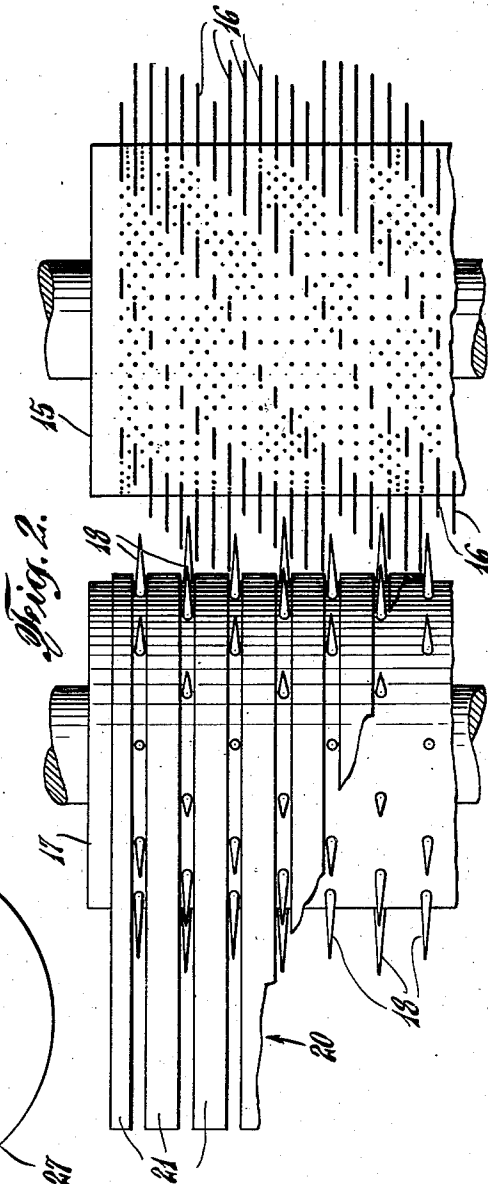
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MACHINE FOR FORMING HEAVY SLIVER LAP

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MACHINE FOR FORMING HEAVY
SLIVER LAP

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6 Claims. (Cl. 19—155)

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My present invention relates to a method of and a machine for forming an unusually heavy web or sliver lap on the front of a cotton or woolen carding machine.

At present, the web conventionally produced on a cotton card weighs between 60 and 75 grains per running yard. To obtain heavier webs or laps it has been proposed to superimpose and compact a plurality of such conventional webs as they are taken from a plurality of cards, and as many as 12 to 14 cards have been placed serially or in tandem to produce a lap. The ultimate weight of sliver lap in such cases is limited by the impracticability of placing and operating so many cards in tandem.

According to my present invention I am enabled to produce on the front of a single cotton card an unusually heavy sliver lap weighing up to 2,000 or more grains per running yard. Such heavy sliver lap is adapted for various commercial applications, for example, the making of cotton fabrics without recourse to spinning and weaving, as a base material for artificial leather, etc. I produce such heavy sliver lap by feeding an ordinary web taken from a card doffer to a condensing means moving at a slower rate than that at which the web is fed thereto, and then stripping the condensed sliver lap from the condensing means. If desired, after the condensed sliver lap is stripped from the condensing means, it may be compacted by passing it through calendar rolls.

My invention will be better understood from the detailed description which follows, when considered in connection with the accompanying drawing, wherein:—

Figure 1 diagrammatically shows the principal elements of my machine arranged at the front of a carding machine, a portion of the card doffer of which is only shown; and

Fig. 2 is a top plan on an enlarged scale of the condensing roll and stripper roll shown in Fig. 1.

Referring to the drawing, the numeral 10 indicates a card doffer of a conventional cotton or woolen carding machine upon which is shown a formed web 11. In front of the doffer 10 there is provided a supporting sheet or apron 12 which is adapted to receive the web 11 as it is stripped from the doffer by a comb 13, in a manner common to such machines. Mounted to rotate within the trough of the apron 12 is a roll 14 having a peripheral surface adapted to engage the surface of the web 11 and feed said web over said apron to a condensing means 15. To accomplish this the roll 14 is preferably in the form of a brush,

the bristles of which may be of pig hair, reed, plastic, fine wire or any other material which is capable of frictionally engaging the surface of the web 11 and move it along as the roll is rotated.

The condensing means 15 which I prefer to use is in the form of a roll or drum, the peripheral surface of which is covered with a clothing having closely spaced circumferential rows of impaling pins 16 which in adjacent rows are staggered and which preferably have their outer portions extending non-radially to the roll. As herein shown, the pins 16 are of the knee type, but it will be appreciated that curved pins or straight pins extending non-radially from the surface of the roll may be used. In Fig. 2 of the drawing, for the purpose of clarity, but a limited number of the impaling pins 16 are shown. The mountings of the rolls 14 and 15 are such that the outer ends of the pins 16 are in interengaging or overlapping tangential relation to the outer ends of the brush bristles so that as the roll 15 is rotated, the outer ends of the pins 16 will penetrate and pass through the peripheral surface of the brush. The condensing roll 15 is mounted for rotation in a counterclockwise direction which is opposite to that of the brush roll 14 and at a peripheral speed much slower than that of the brush roll 14. It will thus be seen that as the web 11 is fed by the brush roll 14 to the condensing roll 15, said web will be progressively impaled on the pins 16 and condensed to form a heavy sliver lap 11a.

Mounted in advance of the condensing roll 15 and rotatable in the same direction as said roll 15 is a stripping roll 17 designed to strip the condensed sliver lap 11a from the condensing roll. The roll 17 is provided on its peripheral surface with circumferential rows of radially extending pins 18, the rows of which are more widely spaced apart than are the rows of the pins 16 on the roll 15. The mountings and the relationship of the rolls 17 and 15 are such that the pins 16 are in overlapping or interengaging tangential relation with the pins 18 to a degree such that the outer ends of the pins 16 move substantially tangentially to the surface of the roll 17. The peripheral speed of the stripping roll 17 is somewhat greater than the peripheral speed of the condensing roll 15, so that as said rolls are rotated, the pins 18 will impale and strip the condensed lap 11a from the pins 16, which action will be apparent from the non-radial relationship of the outer ends of the pins 16 with respect to the roll. As an aid in stripping and feeding the

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sliver lap 11a from the roll 15 I preferably employ an idler roll 19 having a roughened peripheral surface provided by a covering of cork, rubber and the like.

The heavy sliver lap 11a must now be disengaged or stripped from the stripping roll 17, and to accomplish this I provide a stripper plate or comb 20 having a plurality of flat strips or teeth 21 bearing on the periphery of the roll 17 and extending between the circumferential rows of pins 18 and projecting substantially tangentially from the surface of the roll beyond the free ends of the pins thereon. The width of each of these teeth or strips 21 is preferably such as to fill the axial distances between adjacent circumferential rows of pins. The stripper plate 20 is preferably fixedly held in relation to the roll 17 by having one end of the plate anchored in a fixed support 22 and having the opposite end thereof preferably discontinuous, as are the teeth of a comb. It will thus be seen that as the stripping roll 17 is rotated, the impaled sliver lap carried thereby engages the flat stripper plate which functions to remove or strip the sliver lap from its impaled relation on the pins 18, which move through the spaces between the teeth or strips 21.

From the stripper plate 20 the sliver lap may be compacted by being passed through a pair of calender rolls 24 and 25 which provide a considerable draft upon the lap as it leaves the stripping roll. After being compacted by the calender rolls the compacted heavy sliver lap 11b may be wound upon a tube or cylinder 26 in a conventional manner, such as through the aid of wind-up rolls 27 and 28.

No means have been shown for driving the various rolls at their intended speeds and in the directions indicated by the arrows, since it will be apparent that this merely involves the application of well-known mechanical driving devices.

In the operation of my device the thin filmy web 11 is combed from the card doffer 10 by the comb 13 in the usual manner and by means of the revolving brush roll 14 is drawn over the supporting sheet or apron 12 and fed to the condensing roll 15. As stated, the condensing roll 15 rotates relatively slowly in relation to the brush roll 14, with the result that the web 11 is impaled upon and forced inbetween the projecting pins 16 to provide a heavy sliver lap. As the condensing roll 15 revolves slowly with the condensed sliver lap 11a thereon, the stripping roll 17, which revolves slightly faster than roll 15, detaches and raises the condensed lap from the pins 16 and through the aid of the draft provided by the calender rolls, the heavy sliver lap 11a is carried forward to pass through said calender rolls. The stripper plate 20 operates to prevent the pins 18 from carrying the lap around with the roll 17 and as a supporting apron for the sliver lap between the roll 17 and the calender rolls.

It will thus be seen that I have provided an exceedingly simple, practicable and efficient means for tremendously increasing the weight per running yard of a web taken from a card doffer and of producing a heavy sliver lap which is of substantially homogeneous form throughout. It will be understood, however, that my invention may be used to process fibers of different kinds and while I have shown a preferred embodiment of my invention and the manner in which the same is to be carried out, I do not wish to be limited to the precise details of construction and operation disclosed since these may be varied within the range of engineering skill without de-

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parting from the spirit of my invention as defined in the appended claims.

What I claim is:

1. A machine for forming a heavy sliver lap which comprises means for removing an ordinary web from a card doffer, movable condensing means having a surface covered with impaling pins, a rotatable member having a peripheral surface adapted to engage the surface of the web and a supporting sheet over which the web is movable by the rotatable member for feeding the web after its removal from the card doffer to the condensing means at a rate faster than the movement of the condensing means, so that the web will accumulate and build up in thickness thereon, and means for stripping the condensed, built up sliver lap from the condensing means.

2. A machine according to claim 1 wherein the rotatable member for feeding the web after its removal from the card doffer to the condensing means is a rotatable brush.

3. A machine for forming a heavy sliver lap which comprises means for removing an ordinary web from a card doffer, movable condensing means having a surface covered with impaling pins, means for feeding the web after its removal from the card doffer to the condensing means at a rate faster than the movement of the condensing means, so that the web will accumulate and build up in thickness thereon, and a rotatable roll having circumferential rows of pins and a fixed member having flat teeth-like portions extending between the rows of pins and projecting beyond the free ends thereof for stripping the condensed, built up sliver lap from the condensing means.

4. A machine for forming a heavy sliver lap which comprises means for removing an ordinary web from a card doffer, a rotatable condensing roll having a surface covered with impaling pins, means for feeding the web after its removal from the card doffer to the condensing means at a rate faster than the movement of the condensing means, so that the web will accumulate and build up in thickness thereon, and means for stripping the condensed, built up sliver lap from the condensing means comprising a rotatable roll having more widely spaced circumferential rows of pins than the pins on the condensing roll, the pins of said rolls being in interengaging tangential relation, and a stripper plate having flat teeth-like portions extending between the rows of pins on the stripping roll and projecting substantially tangentially from the surface of the roll beyond the free ends of the pins thereon.

5. A machine for forming a heavy sliver lap which comprises a rotatable condensing roll covered with impaling pins, a rotatable member having a peripheral surface adapted to engage the surface of a web after its removal from a card doffer for feeding said web to the impaling pins on the condensing roll at a rate faster than the peripheral movement of the condensing roll, the peripheral boundaries of the condensing roll and the rotatable feeding member being in interengaging tangential relation so that the web will accumulate and build up on the condensing roll to form a sliver lap, and means for stripping the condensed, built up sliver lap from the condensing roll.

6. In combination, a doffer of a carding machine and a machine in front of said doffer comprising a supporting sheet, a rotatable brush adapted to transfer along said sheet an ordinary web from the card doffer, a rotatable condensing roll covered with circumferential rows of pins in

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overlapping tangential relation to the brush, said condensing roll being rotatable at a slower peripheral speed than the brush whereby the web from the doffer card will be impaled on the pins and condensed, a stripping roll having more widely spaced circumferential rows of pins than the pins on the first-mentioned pin-covered roll, the pins on said rolls being in substantial overlapping tangential relation, and a stationary stripper

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plate having a plurality of flat strips each extending between adjacent rows of pins on the stripping roll and projecting substantially tangentially from the stripping roll beyond the free ends of the pins thereon and calender rolls in advance of the stripper plate for receiving and compacting the stripped sliver lap.

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