Nov. 17, 1964 W. E. ROOD, JR 3,157,285

COTTON CLEANER

Filed Oct. 16, 1961 3 Sheets-Sheet 1

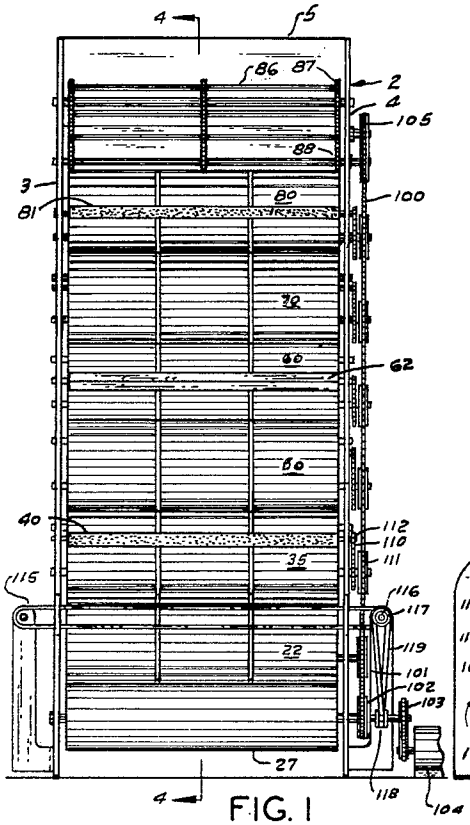


FIG. 1

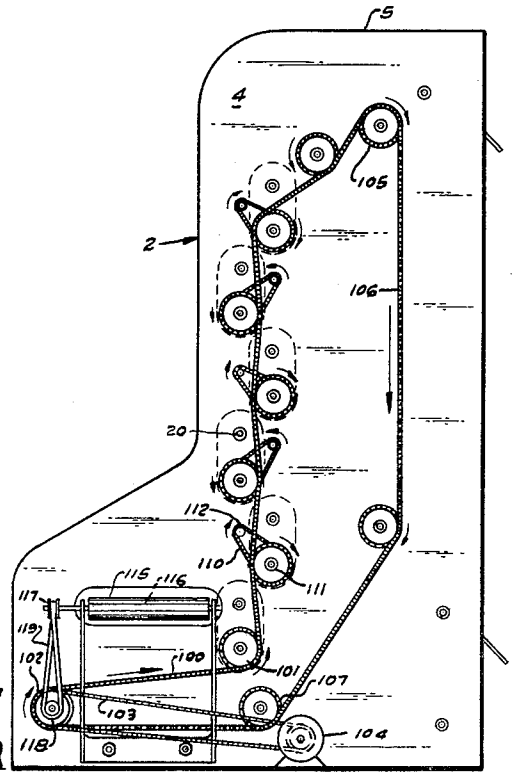


FIG. 3

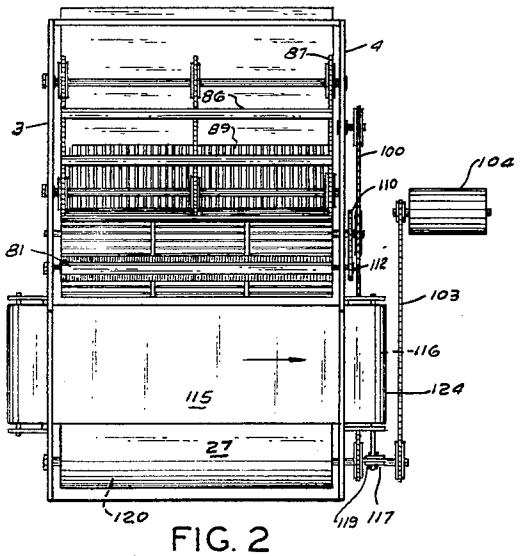


FIG. 2

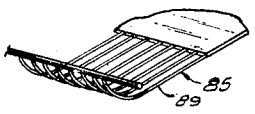


FIG. 5

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COTTON CLEANER

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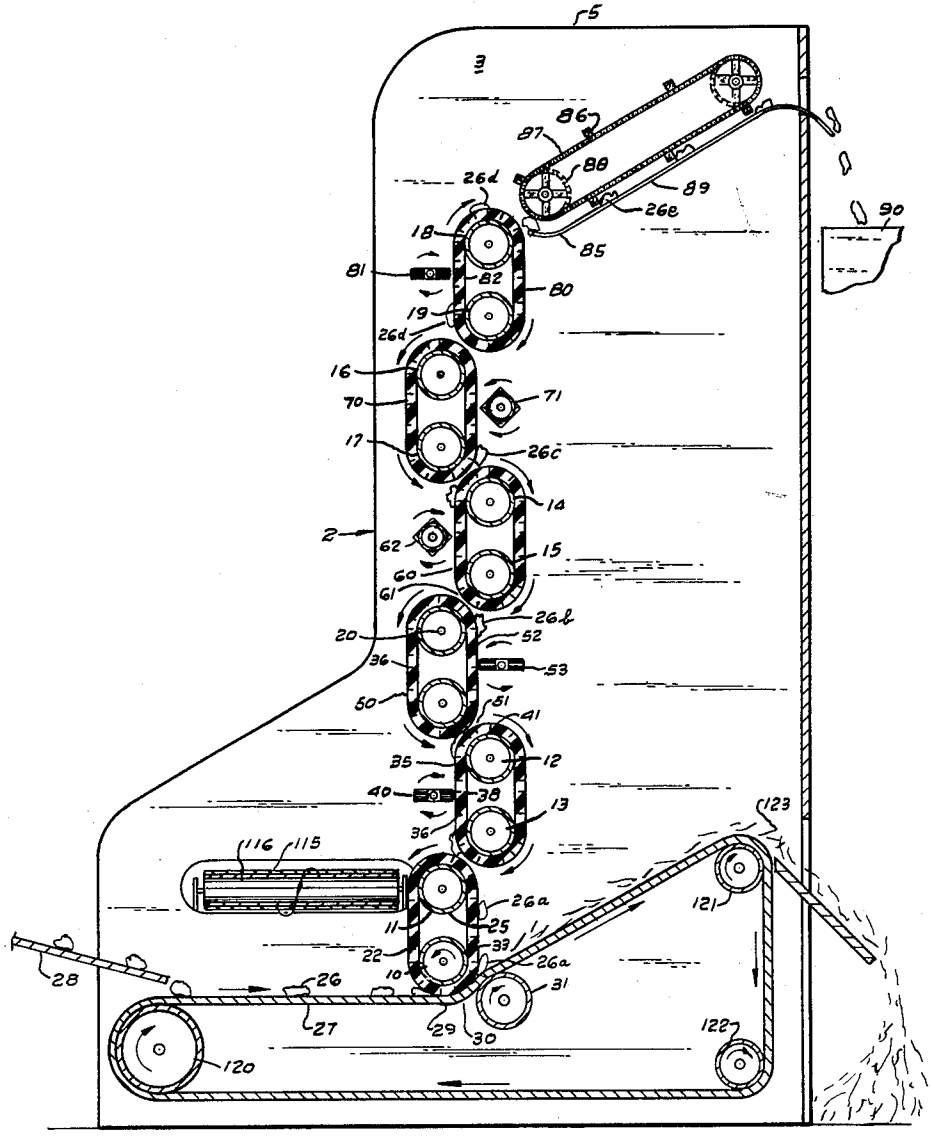


FIG. 4

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COTTON CLEANER

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FIG. 6

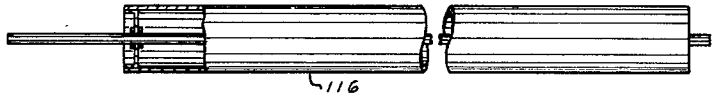


FIG. 7

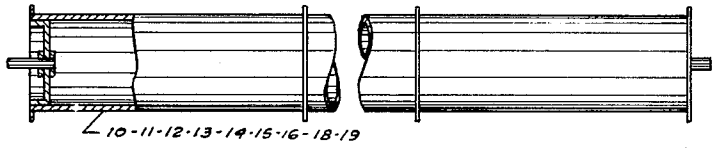


FIG. 9



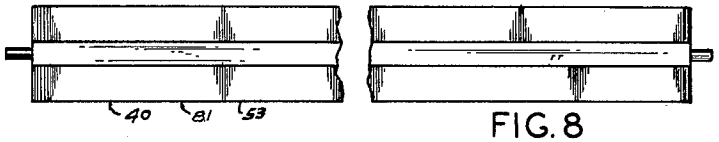


FIG. 8

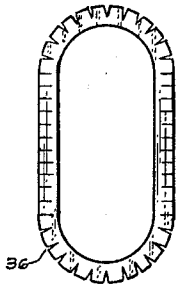


FIG. 11

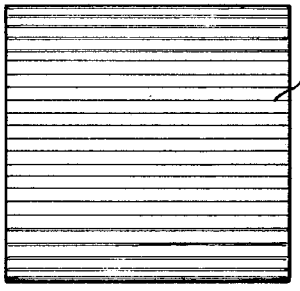


FIG. 10



FIG. 13

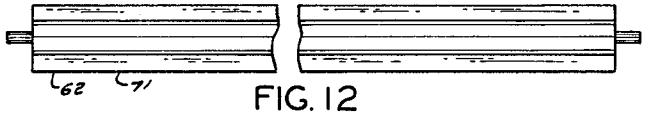


FIG. 12

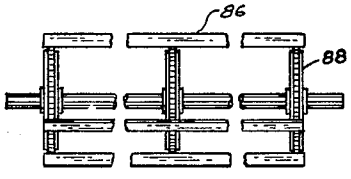


FIG. 15

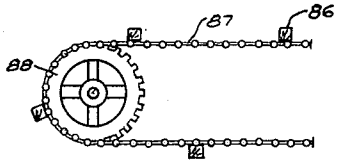


FIG. 14

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United States Patent Office 3,157,285 Patented Nov. 17, 1964

3,157,285

COTTON CLEANER

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Filed Oct. 16, 1961, Ser. No. 145,109
3 Claims. (Cl. 209—78)

This invention pertains to a cotton cleaner.

Heretofore cotton cleaners used for the most part elements which resembled circular saws to tear apart the cotton tufts and release the fibers from dirt and trash. This cleaner uses the principle of the gripping slotted belts shown in the patent to William E. Rood, Jr., et al., dated March 2, 1954, No. 2,670,584, to grip and hold tufts of cotton on superposed, right and left alternately disposed belts, while the tufts are brushed and beaten, first on one side and then on the other side, but does not tear the tufts of cotton apart while they are being cleaned.

One of the objects of the cleaner is to provide a device which will receive cotton introduced at the bottom of an enclosing case and convey tufts of cotton from one slotted belt to another so that each tuft is cleaned by oppositely positioned cleaning elements while at the same time sticks and trash are removed and discarded.

Another object is to provide a series of transversely slotted belts running over rollers which will grip and lift tufts of cotton so that they are separated from sticks and trash which may be mixed with the cotton tufts; said belts running over rollers so as to form a sharp bend in the conveying belts over which the sticks and trash cannot travel, and arranged so that sticks and stems are forced out tangentially from the bends in the belts as they run over rollers.

Still another object is to provide a series of transversely slotted belts, operating as aforesaid, with means for removing cotton tufts from the belts at the top of the last roller of a series of belts and to provide intermediate brushing and beating mechanism which will remove all trash, sticks and leaves from the cotton and convey the trash to a place of deposit separate from the cleaned cotton.

I attain the foregoing objects by means of the devices, parts and combinations of parts shown in the accompanying drawings, in which—

FIGURE 1 is a front elevational view of the device with the near wall of the containing case removed to show the interior of the entire cleaner;

FIGURE 2 is a plan view of the device as shown in FIGURE 1;

FIGURE 3 is a side elevational view of the device as shown in FIGURE 1;

FIGURE 4 is a sectional view of the mechanism within the containing case, drawn on an enlarged scale and with the section taken substantially on lines 4—4 of FIGURE 1;

FIGURE 5 is a perspective view of a cotton pick up scoop;

FIGURE 6 is an elevational view of a roller used to support a conveyor belt within the machine;

FIGURE 7 is an elevational view of a transverse belt roller used to support the cleaner belts within the machine;

FIGURE 8 is a side elevational view of a brush used to remove dirt and trash from the cotton held on the slotted belts of the machine;

FIGURE 9 is an end view of the brush shown in FIGURE 8;

FIGURE 10 is a side elevational view of a slotted belt used to support and convey cotton tufts within the machine;

FIGURE 11 is an end view of the belts shown in FIGURE 10;

FIGURE 12 is a side elevational view of a beater used to remove dirt from tufts of cotton passing through the machine;

FIGURE 13 is an end view of the beater shown in FIGURE 12;

FIGURE 14 is a fragment of the conveyor chain used to remove cotton from the last cleaner belt; and

FIGURE 15 is an end view of a portion of the conveyor shown in FIGURE 14.

Similar numerals refer to similar parts in the several views.

The mechanism hereinafter described is contained within a case 2 having side plates 3 and 4 and a top closure 5. The bottom is open as herewith illustrated.

Within the case there are a plurality of rollers 10 and 11, 12 and 13, 14 and 15, 16 and 17, 18 and 19, all journalled on centrally disposed axles 20 which are journalled at each end in the respective side plates 3 and 4 of the case 2. These rollers operate in vertically disposed pairs. Each pair of rollers supports a transversely slotted belt shown in FIG. 4 as belts 22, 35, 50, 60, 70, and 80, respectively. The belts are identical and operate by running over the various rollers in much the same manner. The lower pair of rollers 25 operates to pick up tufts of cotton 26 from the plain feed belt 27. This feed belt runs transversely of the body 2 near its bottom. Cotton is fed onto belt 27 from any convenient means such as chute 28. As the conveyor belt 27 passes under the bend 29 of the first pickup belt 22, it is bent at 30 by the roller 10 pressing down on its upper side and the roller 31 pressing upward on the under side of belt 27 at a point just beyond the center of roller 10. This arrangement of rollers and belts places a definite bend 30 in conveyor belt 27 and presses it against the outer surface of pickup belt 22. This action tends to crush and break any trash, such as stems, sticks and leaves of cotton plants that may be picked up with the cotton tufts 26 as they are fed into the machine.

At the same time the transverse cuts or slots in belt 22 open as they travel around lower roller 10. Fibers from the tufts 26 of cotton fed into the machine are then clamped by the sides of the transverse cuts or slots in the pickup belt 22 and, as the pickup belt leaves the contact area 30 with conveyor belt 27, the slots again close as the pickup belt moves to the vertical portion 33 of its travel. This vertical portion may be termed the inner lay of the pickup belt. While cotton tufts 26 are easily transferred from conveyor belt 27 to pickup belt 22, trash stems and sticks cannot go around the bend, and are ejected from the contact area, and leave tangentially relative to the lower bend of pickup belts 22 around roller 10. This transh 123 rides outward on belt 27.

As the slots close they clamp onto tufts 26*a* of cotton so that the tufts are carried vertically on belt 22 and are not released until this belt runs over roller 11 at the top of its travel.

At the top of its travel, belt 22 moves to a position so that it will be substantially in contact with belt 35, which is positioned above and to the right of pickup belt 22. Belt 35, being constructed in the same way as belt 22,

has transverse slots which open as it goes around its lower supporting roller 13. These slots, marked 36, in FIGURE 4, tend to receive the fibers of tufts 26*a* of cotton and grasp them as the belt 35 moves to its outer lay 38. As belt 35 moves to the position of its outer lay, the tufts are grasped by their fibers and subjected to a brushed action by the rotary brush 40, thus they are grasped on one side and brushed on the opposite side, and are then carried upward to the upper bend 41 of belt 35. At the bend 41 they are released when the belt runs over upper roller 12.

At the point of contact between the upper bend 41 and the next adjacent belt 50, the tufts are released by belt 35 and picked up by the transverse slots in belt 50. It will be noted that belt 50 is running in a counterclockwise direction and that tufts of cotton, after leaving the point of contact at 51, are then carried upward on the inner lay 52 of this belt and are contacted by and brushed on the opposite side by the rotary brush 53. Note that the brush 53 operates also in a counter-clockwise direction to brush off and remove dirt and broken pieces of leaves, stems and the like. The tufts 26*b* are then transferred to the next belt 60 at the contact area 61. It is to be noted that belt 60 moves in a clockwise direction. The tufts are then subjected to a beating action by the square shaped rotary beater 62 which rotates in a clockwise direction. This beats the left side of all tufts grasped by the transverse slots in belt 60.

Tufts 26*c* are then transferred to the next higher belt 70 which runs in a counter-clockwise direction and are conveyed upward and past the rotary square beater 71 which operates in a counter-clockwise direction.

Lastly, the tufts marked 26*d*, are conveyed to the topmost pickup belt of this set of pickup belts, which is marked 80. The belt operates in a clockwise direction and carries the tufts by brush 81 on its outer lay 82. The tufts 26*d* are then released into the basket 85 as the belt 80 goes over the top roller 18 and the slots open.

From the basket 85 the tufts are carried by scrapers 86 on the conveyor chain 87, running over sprockets 88. The cotton tufts now known as 26*e*, are scraped upward on the grill-like bottom 89 of basket 85 and carried to a place of deposit marked 90, which is outside of the machine case 2.

Rotary motion of the several pulleys, previously mentioned, is provided by a chain 100 which runs over sprockets, such as 101 on the outer end of the shafts supporting rollers, such as 10, 11, etc. This chain 100 is driven by a sprocket 102 which is, in turn, driven by a chain 103 from a motor 104. The chain is continuous and after leaving the top most pulley 105, descends at 106 to a pulley 107 near the bottom of the case.

Since the chain 100 goes between the various sprockets on the ends of the shafts of the various rollers, the desired direction of rotation is attained. Small chains 110 run over sprockets just behind the sprockets which are on the ends of the roller shafts, these sprockets being indicated by 111 and operate the chains, such as 110 to turn sprockets 112 on shafts which support the various brushes, such as 40, 53 and beaters, such as 62 and 71. All these parts move at the same time.

In addition to the foregoing, a trash removal canvas belt 115, runs over rollers 114 and 116 which are connected by pulleys 117 and 118 by a belt 119. In this way the belt 115 is driven from pulley 118 which is, in turn, driven by a sprocket and chain 103. This is the belt which is driven by motor 104. At the same time the feed belt 27 is driven by roller 120 and runs over rollers 121 and 122 and is at the same time tightened and pressed outward by roller 31, as above explained.

As as result of the foregoing, cotton tufts entering from chute 28 are picked up by belt 22 and the other belts, previously mentioned, positioned above it, and carried to the top most belt 80 and deposited on the grid-basket 85 from which they are moved to bin 90. During this process all trash, including sticks, leaves and other matter is crushed first at 30 and then at each contact between the several pickup belts where the cotton tufts are transferred from one belt to another. Crushed dry material drops onto the outer end of conveyor belt 27 and is deposited at 123 on a chute leading outside of case 2. Material which drops off of the front side of the various belts drops onto conveyor belt 115 and is carried out of the machine on the right end of this belt at 124.

As a result of this action, only tufts of cleaned cotton is deposited in bin 90. The brushing and beating action of the various rotary brushes and rotary beaters tends to loosen and remove all trashy material and bits of stems and leaves that may have been mixed in with the cotton 28. This material is deposited at 123 and 124 and the clean cotton separated, as above explained, is deposited at 90.

I claim:

1. A cotton cleaner comprising a frame, a plurality of pairs of pickup belt rollers journaled in said frame, one of each pair of rollers being a lower roller and the other roller disposed above it being an upper roller, cotton pickup belts of the type having transverse cuts on their outer surfaces which open as the belts bend over said rollers, said belts returning over said rollers and forming lays between said rollers, power means for rotating said rollers to drive said belts, the upper and lower bends of successive adjacent belts being substantially in contact and said rollers being offset at said contact areas so that said belts will grip alternate sides of cotton tufts as said tufts are transferred from one belt to another, a flat feed belt running horizontally over rollers and traveling transversely to said pickup belts with its top lay running in contact with the lower bend of the lowermost pickup belt, a cleaned cotton receiving chute disposed to receive cotton released at the top bend of the uppermost pickup belt, a chain operated scraper operating in said chute to remove cotton along said chute, a transverse roller operating in contact with the underside of the top lay of said feed belt and being offset in the direction of the feed belt travel and forcing said feed belt around the lower outer quadrant portion of said pickup belt so that all unbendable material will be crushed and forced tangentially from the area of contact between the pickup belt and said feed belt.

2. A cotton cleaner comprising a frame, a plurality of pairs of pickup belt rollers journaled in said frame, one of each pair of rollers being a lower roller and the other roller disposed above it being an upper roller, cotton pickup belts for grasping cotton as the belts bend over the corresponding rollers, power means for rotating said rollers to drive said belts, the upper and lower bends of successive adjacent belts being substantially in contact and said rollers being offset at said contact areas so that said belts will grip alternate sides of cotton tufts as said tufts are transferred from one belt to another, a flat conveyor running horizontally over rollers and traveling transversely to said pickup belt with its top lay running in contact with the lower bend of the lowermost pickup belt, a transverse roller operating in contact with the underside of the top lay of said conveyor and being offset in the direction of conveyor belt travel, and forcing said conveyor belt around the lower outer quadrant portion of said pickup belt so that all unbendable material will be crushed and forced tangentially from the area of contact between the conveyer belt and said pickup belt.

3. A cotton cleaner comprising a frame, a pair of pickup belt rollers journallel in said frame, one of said pair of rollers being a lower roller and the other roller disposed above it being an upper roller, a cotton pickup belt of the type having transverse cuts on its outer surface which open as the belt bends over said rollers, said belt returning over said rollers forming vertical lays between said rollers, power means for rotating said rollers

to drive said belt, a flat feed belt running horizontally over rollers and traveling transversely to said pickup belt with its top lay running in contact with the lower bend of said pickup belt, a transverse roller operating in contact with the underside of the top lay of said feed belt and being offset in the direction of the feed belt travel and forcing said feed belt around the lower outer quadrant portion of said pickup belt so that all unbendable material will be crushed and forced tangentially from the area of contact between the pickup belt and the feed belt.

References Cited by the Examiner

UNITED STATES PATENTS

1,480,792	1/24	Struen	209—74
1,574,947	3/26	Struen	209—74
2,670,584	3/54	Rood	56—28
2,836,856	6/58	Franks	209—74
2,843,264	7/58	Pfister	209—108

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