Sept. 6, 1955 B. D. BURNS 2,716,856

PNEUMATIC COTTON GATHERER

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FIG. 1

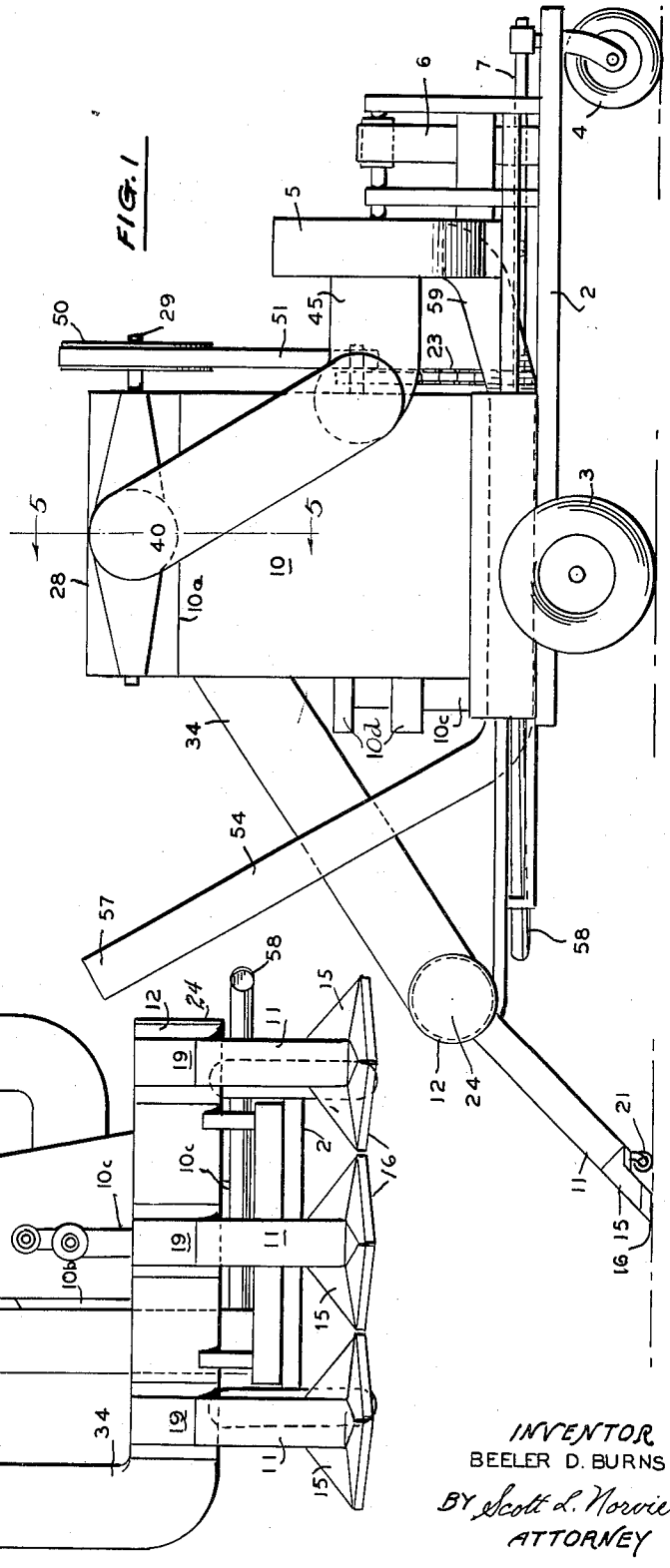


FIG. 3

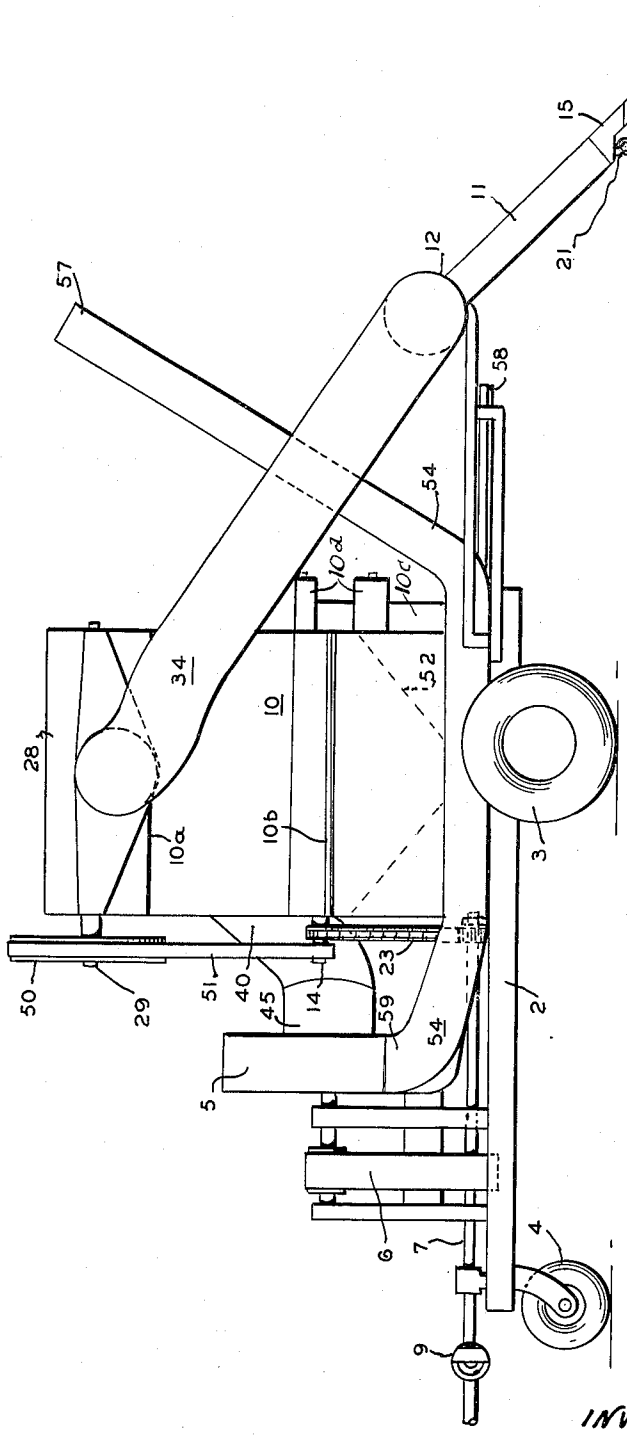
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FIG 2



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FIG. 4.

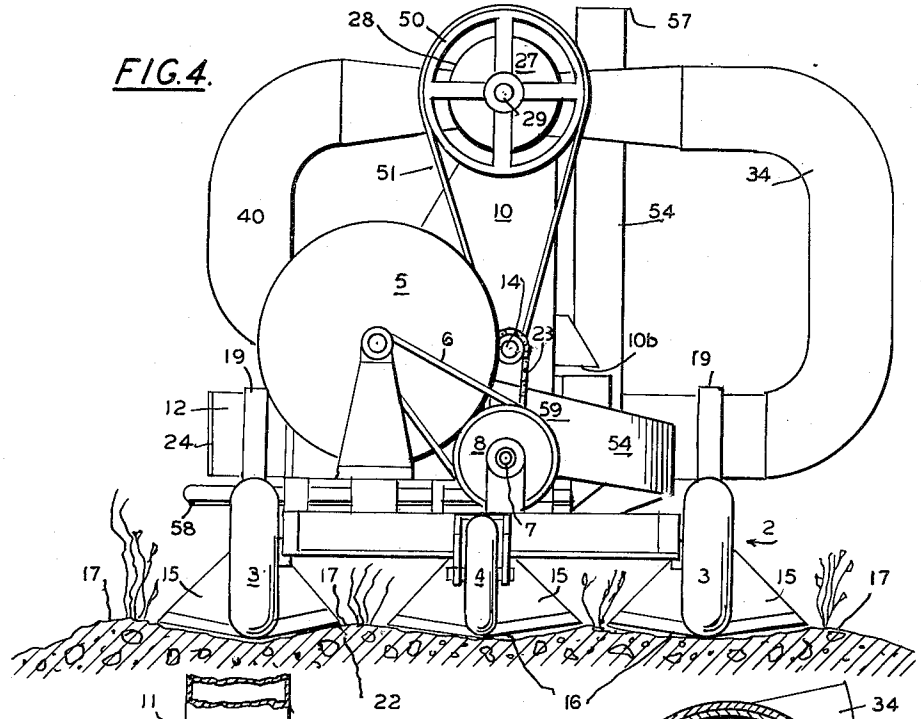


FIG. 7.

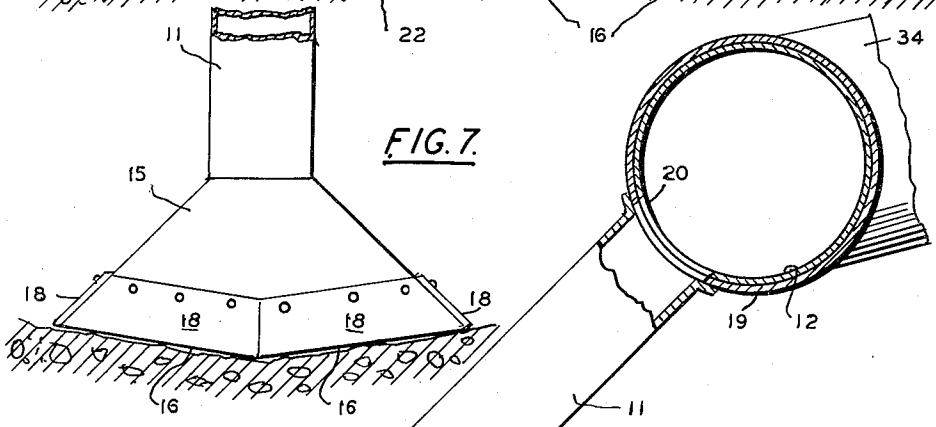
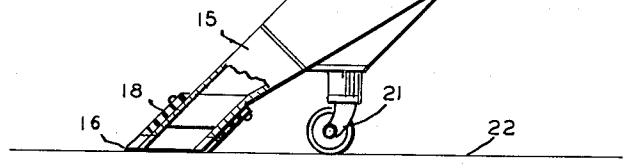


FIG. 6.



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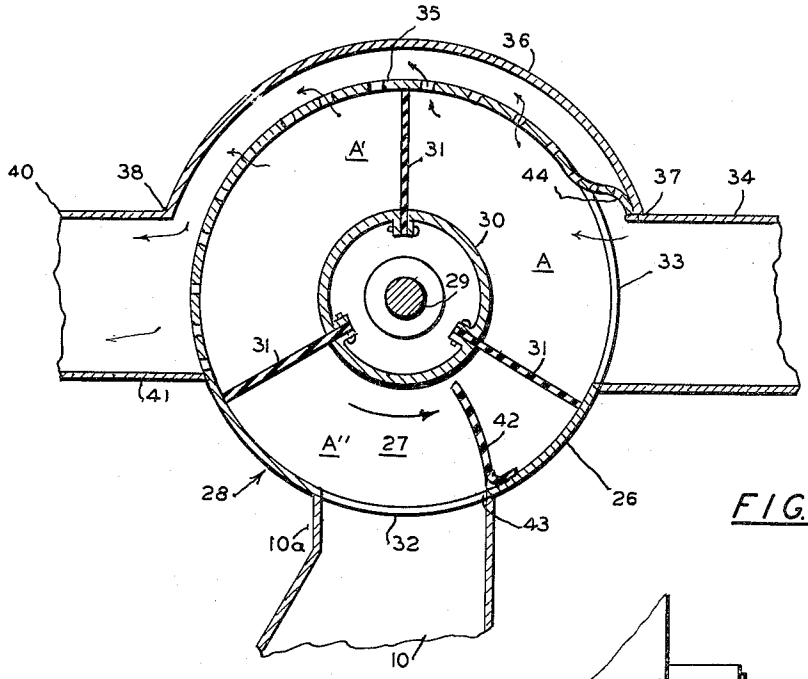


FIG. 5

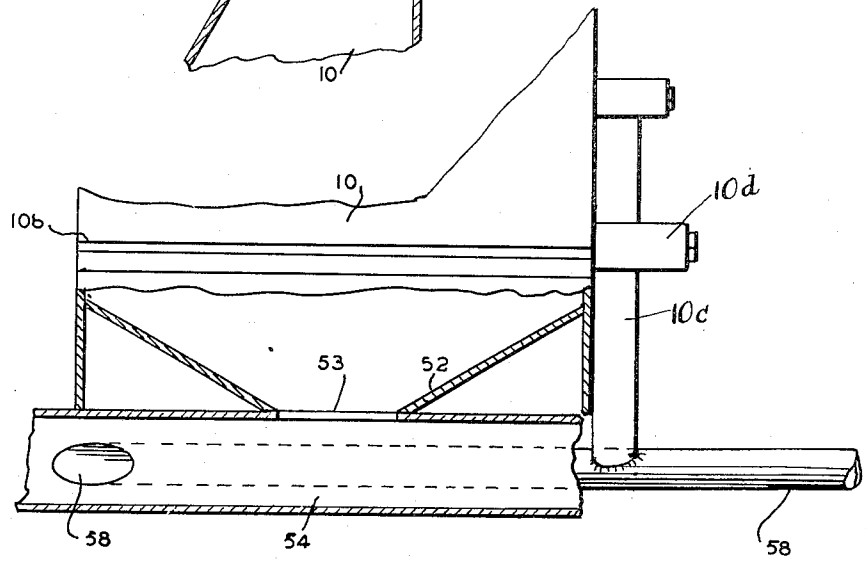


FIG. 8.

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PNEUMATIC COTTON GATHERER

Beeler D. Burns, Coolidge, Ariz.

Application October 1, 1952, Serial No. 312,566

3 Claims. (Cl. 56—30)

This invention concerns cotton salvaging implements.

It has been recognized that the use of machine cotton pickers creates a large loss of cotton which is knocked down on to the ground by the machine and cannot be retrieved by it. If this cotton is left on the ground any length of time it becomes mixed with earth, plant stems and other debris to such an extent that it has no value for commercial purposes. Vacuum apparatus has been suggested as a possible means for recovering this grounded cotton; but it has been found that cotton drawn up from the earth by suction invariably carried with it so much debris, as above mentioned, that it was either graded down at the gin or declared entirely unsuitable for ginning. One very salient reason for the poor condition of cotton salvaged in this manner was because in handling, and transporting the recovered cotton the dirt, plant stems, and debris was worked into the cottons bolls and tufts and intermixed so that cleaning became impractical if not impossible. As a result of this a great deal of recoverable cotton was plowed under.

I have found however, that if such grounded cotton is picked up by vacuum or suction and immediately cleaned the earth and debris is not worked into it and it can be successfully cleaned and salvaged.

In view of the foregoing, one of the objects of my invention is the provision of a wheeled tractable implement which has power driven suction mechanism on it arranged so that suction applicators may be moved through a field following the cotton plant rows and will draw cotton from the ground and convey it, immediately to a cotton cleaner, and will then dispose of the dirt and debris, and convey the cleaned cotton through an air blast pipe to a conveniently positioned vent which will deposit it in a portable cage or collector.

Another object is to provide such an implement with applicators on hingedly mounted suction pipes arranged so that the applicators will follow the contour of the ground and remain a predetermined distance above it.

Still another object is to provide means for separating the cotton entrained in the air flow from said applicators from said flow and for dropping it into the cotton cleaner with a minimum of turbulence and without mashing the seeds.

Other objects will appear hereinafter.

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

Figure 1 is a side elevation of the left side of the entire implement;

Figure 2 is a side elevation of the right side of the implement;

Figure 3 is an elevational view of the rear of the machine;

Figure 4 is an elevational view of the front of the machine;

Figure 5 is a transverse sectional elevation of the cotton dropper drawn on an enlarged scale; said section being taken on line 5—5, Figure 1;

Figure 6 is a side elevational view of one of the suction applicators drawn on a somewhat enlarged scale, and with portions broken away to show the interior construction.

Figure 7 is a rear elevational view of one of the suction applicators; and,

Figure 8 is a fragmentary portion of the frame structure showing the dirt disposal ducts.

Similar numerals refer to similar parts in the several views.

The complete implement is supported on a frame 2, which runs on wheels 3 on each side at the rear and steerable wheel 4 at the front. At the front of this frame there is a blower 5, of the centrifugal type, which is driven by a belt 6 which runs on a pulley 8 on shaft 7. This shaft is provided with a suitable coupling and universal joint 9, so that it may be driven by the power take-off of a tractor which pulls the implement.

Behind the blower there is a cotton cleaner 10. This is of conventional construction such as is ordinarily used in gins and is well known to the art.

The type shown in outline is a Lummus cleaner such as is illustrated in Patent No. 2,009,047 issued to T. S. Grimes July 23, 1935, which cleans cotton mechanically by dropping it between rotors having radial picker teeth and drums having rows of saw teeth on their peripheries. The cleaner has a rectangular body with an inlet opening 10*a* at the top, a hooded delivery slot 10*b* on the right side, as viewed in Figure 4, and a bottom vent 10*d* for dirt and trash which is removed with a screw conveyer, and dropped into a vertical duct 10*c* which in turn deposits the dirt and trash in tube 58.

The mechanism of the cleaner is driven by chain belt 23 from shaft 7 which runs over a sprocket on its main drive shaft 14.

At the rear of frame 2 there is a transverse row of applicator suction pipes 11, which are hinged and supported on transverse suction pipe 12. These suction pipes have applicators 15 at their lower ends. The applicators 15 are shaped to provide transverse suction slots on their bottoms. Their bottom edges 16 extend upward from the center, somewhat, so that they will conform to the somewhat rounded contour of the depressions of the spaces between the cotton plant rows 17. These edges are reinforced with flexible rubber strips 18. The upper ends of pipes 11 are provided with collars 19 which fit over and bear on transverse pipe 12. Holes 20 in pipe 12 register with the upper end openings of applicator pipes 11 when these pipes trail at a downward and rearward angle from pipe 12.

Caster wheels 21 ride over the ground 22 and support the applicators so that edge reinforcing strips 18 are maintained a predetermined distance above ground level.

At the top of the cleaner there is a cotton separator and dropper 28. This consists of a cylindrical body 26 closed at each end by disks 27. A shaft 29 extends axially through said body and is journalled near each end in disks 27. A hub cylinder 30 is mounted on this shaft, extends longitudinally through the interior of the cylinder, and has equally spaced flexible rubberized fabric fins 31 extending radially from its perimeter. The outer edges of these fins bear in substantially airtight relation on the inner face of body 26.

In the bottom portion of the wall of body 26 there is a longitudinally extending rectangular opening 32 which opens into the top inlet of cleaner 10.

A rectangular longitudinally extending opening 33 on the right side of body 26 connects, through a suitable header, to inlet pipe 34 which is connected to one end of transverse suction pipe 12. The other end of pipe

12 is closed by a plug disk 24. The upper portion of cylinder 26 is perforated to form a perforate screen area 35. An arcuate hood 36 covers this perforate portion and extends from the upper side 37 of opening 33 to the upper wall 38 of outlet pipe 40 on the opposite side of body 26. The lower wall 41 of this pipe joins body 26 along the lower left edge of the perforate portion 33. A flexible flap 42 of rubberized fabric extends along the right or leaving edge 43 of outlet opening 32 and normally reaches substantially to the outer surface of hub cylinder 30. Along the right hand edge of perforate portion 35 there is an outwardly offset longitudinally extending groove or channel 44. This forms a longitudinally extending pocket adjacent the upper edge 37 of opening 33, and forms smooth transition surface between the interior surface of the body 26 and each of the fins 31.

Outlet pipe 40 is connected to the inlet 45 of blower 5.

Shaft 29 is turned counterclockwise at a slow speed (about 60 R. P. M.) by pulley 50 driven by belt 51 from the main shaft 14 of cleaner 10. This turns fins 31 within body 26 so that each one successively wipes or scrapes cotton from the perforated portion 35.

In operation, suction from blower 5 draws air with entrained cotton from the ground through applicators 15, pipes 11, 12, and 34 and into the dropper body 26 through opening 33. There it enters space "A" which is one of three longitudinally extending sectorial areas indicated as A, A' and A" between the inner face of body 26 and the outer surface of hub cylinder 30, and divided by fins 31. The cotton is stopped by the screen 35 while the air flows on into hood 36 and thence out pipe 40 to blower 5.

Fins 31 scrape cotton from the inner face of screen 35 as they pass over it. In area A' there is little air flow and the cotton tends to fall toward hub cylinder 30 and away from screen 35. In area A" there is substantially no air flow and the cotton drops into the top of cleaner 10 through opening 32. The flap 42 aids in channeling the cotton into this opening and in closing area A" from area A. Fins 31 slide over flap 42 as they move in their circular paths.

Groove 44 provides a smooth transition from the upper edge 37 of opening 33, and as each of the fins 31 move toward it, during rotation, the velocity of air flow increases through the narrowing slot between these parts and this keeps cotton from accumulating along the portion of the screen adjacent edge 37.

Cleaned cotton is delivered from the cleaner outlet 10*b* into a hopper 52 which has a comparatively small rectangular vent 53 in its bottom. This vent opens into the delivery or stacker pipe 54. The stacker pipe receives air from the outlet 59 of blower 5 and forces cotton to the rear end 57 where it may be caught in any convenient perforate receptacle or cotton crib.

Dirt and debris removed from the cotton by cleaner 10 passes from the bottom of duct 10*c* out of cleaner 10 and drops into tube 58. This tube is connected to main exhaust pipe 54 at a point where there is sufficient positive pressure to provide a strong draft of air flowing outward through tube 58. This draft of air picks up the dirt and debris dropped into it from duct 10*c* and blows it out to one side of the implement body. The connections between ducts 10*c* and pipe 58 are best shown in Figure 8.

I claim:

1. A cotton salvaging implement comprising a mobile frame, a mechanically operated cotton cleaner vertically mounted on said frame and having an open upper inlet end and provided with separate outlets for cotton and dirt, a blower having an intake and an exhaust end mounted on the frame, a transverse suction header mounted on one end of the frame, a cotton separator mounted over the cleaner in communication with the upper inlet end, a duct connecting the header to the separator, ground engaging suction pipes carried by the header and terminating in inlet means conforming to the curvature of the spaces between cotton plant rows, said suction pipes being spaced apart on the header to be disposed between side by side rows, a duct connecting the separator to the blower, means operatively mounted in said separator and disposed within the suction line from the blower to the suction pipes for intercepting the cotton and dirt and closing off the inlet end of the cleaner to the suction while permitting the free gravitation of the cotton and dirt into the inlet end of the cleaner, a duct connected to the exhaust end of the blower and connected to the cotton outlet in the cleaner so as to blow the cleaned cotton to a storage receptacle and means for diverting a portion of the air in said duct to the outlet for the dirt, including a duct communicating with said dirt outlet, for moving the dirt from the outlet.

2. A cotton salvaging implement comprising a wheeled frame, a blower mounted on the frame and having an inlet pipe connected to its intake side and an outlet pipe connected to its exhaust side, a mechanically operated cotton cleaner mounted on the frame and having an inlet and separate outlets for cotton and dirt, means connecting said blower outlet pipe to the outlet for the cotton so that the cotton is moved to a storage receptacle by such exhaust air, means on said outlet pipe for diverting some of the exhaust air from the outlet pipe, to the dirt outlet for moving the dirt from the outlet, a cotton separator mounted on the cleaner and having a lower discharge opening overlying the inlet of the cleaner, said air inlet pipe of the blower being connected at one end to the separator above and at an angle to the lower discharge opening thereof, a transverse main suction pipe mounted on one end of the frame, suction pipes carried by the main suction pipe in fluid communication therewith and being spaced apart thereon to be disposed between cotton plant rows, for picking up the cotton from the ground, a duct connected to the main suction pipe and connected to the separator at a point opposite to and aligned with the end of the air inlet pipe of the blower so as to create a suction line from the blower to the suction pipes through the separator and above the discharge end thereof, and means in the separator intercepting the cotton and dirt in the suction line and closing off the inlet of the cleaner from the suction line while permitting the free gravitational movement of the cotton and dirt into the inlet of the cleaner.

3. A cotton salvaging implement as claimed in claim 2, wherein said last means includes a perforated wall in said separator interposed in the suction line and blocking the passage of the cotton through the separator and a plurality of rotatable members mounted in said separator and sweeping over the wall and dividing the separator into separate rotating chambers, each chamber being of a dimension to separately overlie the discharge end of the separator so as to permit the cotton accumulated therein by the members sweeping over the wall to drop through the discharge end into the inlet of the cleaner while isolating the discharge end from the suction line.

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