July 18, 1933. S. D. MURRAY 1,918,774

COTTON CLEANER AND FEEDER

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FIG. 1

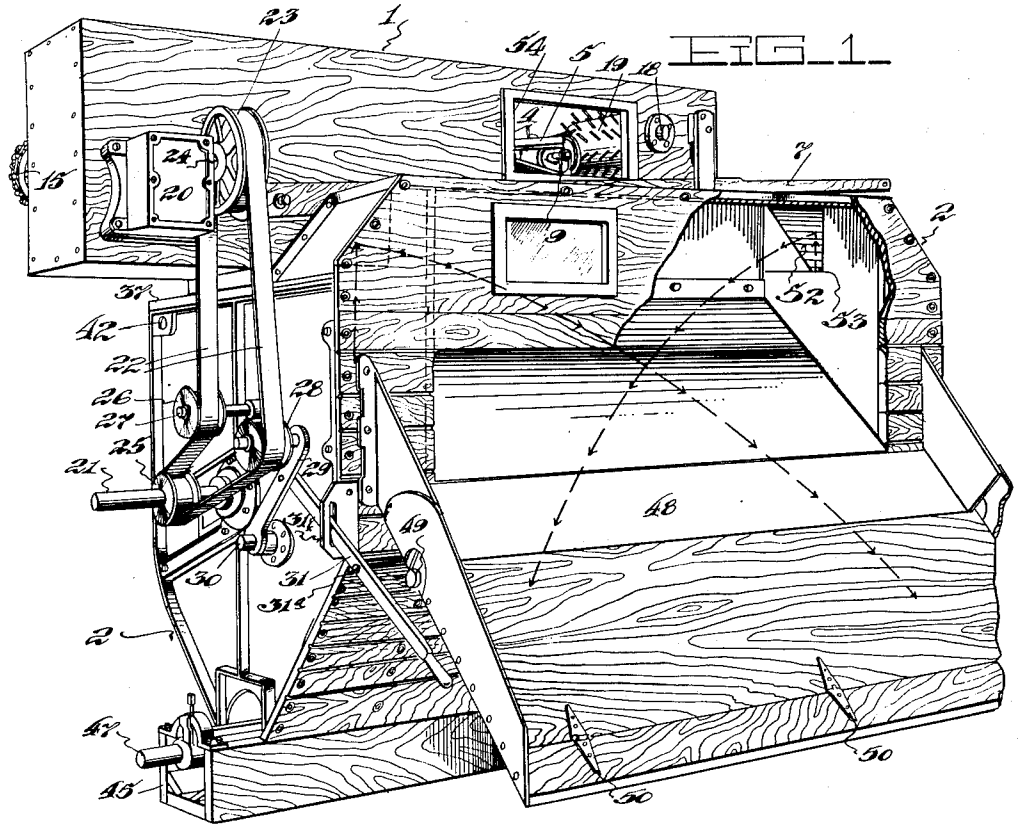
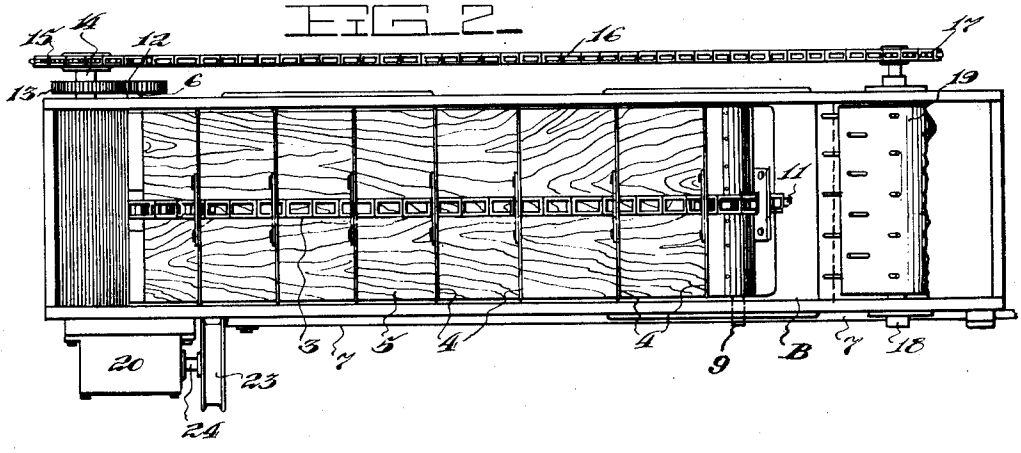


FIG. 2



S. D. Murray.
INVENTOR.

BY Ernest G. Hood

ATTORNEY.

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COTTON CLEANER AND FEEDER

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FIG. 3.

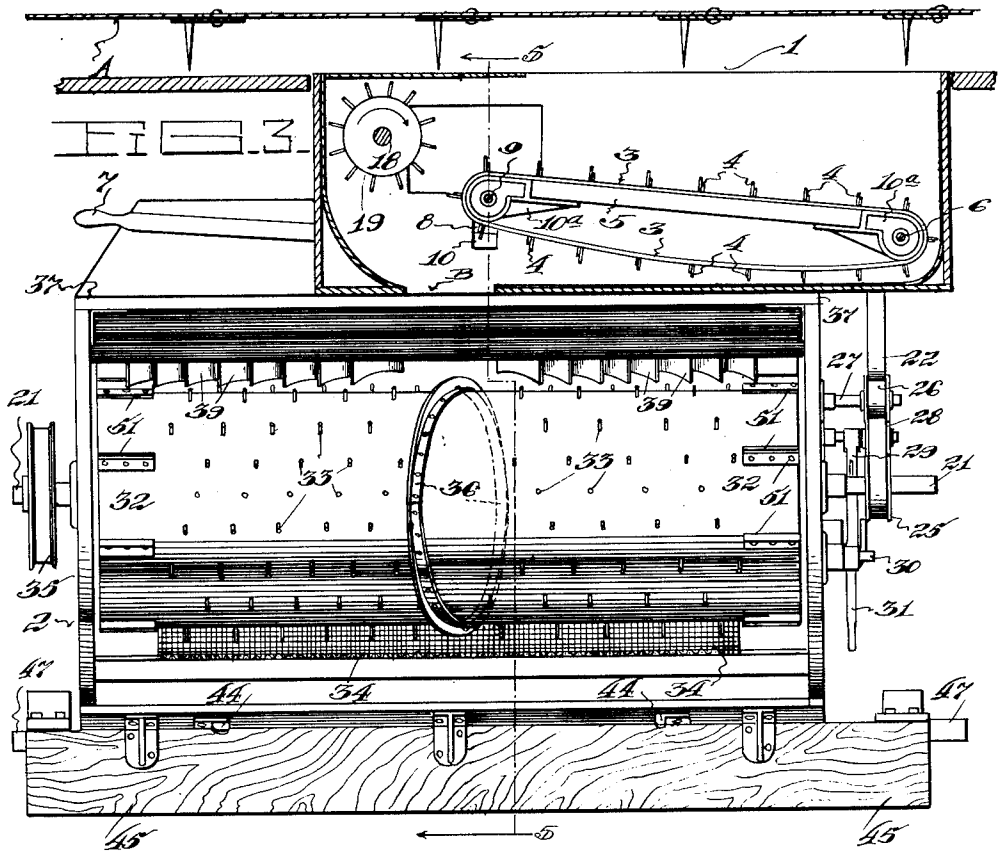
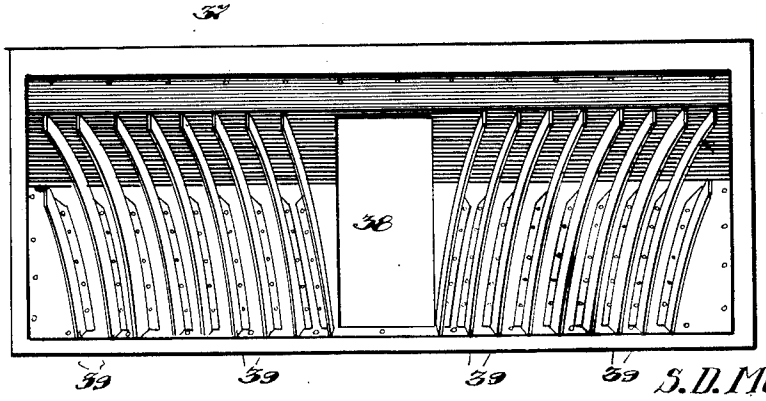


FIG. 4.



S. D. Murray
INVENTOR.

BY Ernest G. Shaad
ATTORNEY.

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FIG. 6

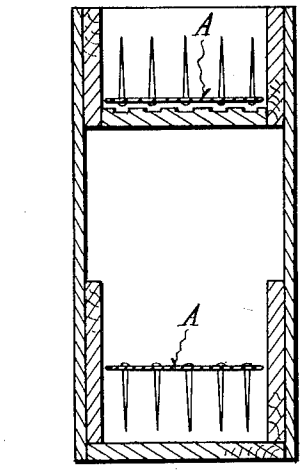


FIG. 5

S. D. Murray
INVENTOR

By Innes & G. Woods

ATTORNEY

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UNITED STATES PATENT OFFICE

STEPHEN D. MURRAY, OF DALLAS, TEXAS

COTTON CLEANER AND FEEDER

Application filed July 15, 1929. Serial No. 378,442.

This invention pertains to cotton gin feeders that apply to cotton a cleaning action coincident with the feeding operation.

The invention particularly pertains to gin feeders, the feeder drum and foraminous element of which are arranged in the regular conventional parallelism of the feeder drum and element with the ginning elements.

In cotton gin feeders arranged in parallel relation to the ginning elements as stated there has heretofore appeared no way to extend or elongate the screening path traversed by the cotton except by enlargement of the feeder body to accommodate additional parallel cylinders and concaves, and multiple cylinder cleaning feeders are now coming into vogue as rivals of the old style single cylinder machines heretofore in general use over the cotton regions.

The objects of the invention center about and are primarily concerned with the feeders in parallelism as above mentioned.

The principal object is the manifold increase or extension, of the cleaning action, and its effectiveness in single cylinder cleaning feeders as above.

The major factor that determines the effectiveness of the cleaning action in cotton gin feeders is the longitudinal dimension of the screening path traversed by the cotton under the action of the feeder drum.

As to further objects of the invention, applicant affirms that all good and useful ends, purposes and economies served or attained through the instrumentalities of this invention are deemed as within the category of its objects. From the drawings and text matter herewith, those well versed in the art will readily comprehend the simple character of the scheme and its potency for an extraordinary extension of the effectiveness of the cleaning action in gin feeders for removal of siftable trash.

With the foregoing in view, reference is made to the drawings wherein;—

Figure 1 is a perspective view of the invention, with a portion broken away to illustrate the cotton discharge.

Figure 2 is a plan view of the feeding hopper.

Figure 3 is a rear view of the invention with the rear walls removed from both the cleaner and feeding hopper to show interior parts.

Figure 4 is a view of the underside of the top cover 37 of the feeder, showing the deflector blades for deflecting the rotating cotton toward either end of the machine. The deflectors being effective for steadily advancing the cotton toward the delivery outlet.

Figure 5 is a sectional view on lines 5—5 of Figure 3, and

Figure 6 is a sectional view of the conventional distributor belt, a part of which is shown in Figure 5.

The improved machine, briefly stated, has a hopper that receives the cotton from the ordinary distributing belt in the regular way, the hopper having a bottom pivotally supported at one end to allow its opposite end to be moved upwardly and downwardly, toward or away from the distributor belt. The feed to the gin mill will be more or less according as the loose end of the bottom 5 is moved farther from or nearer to the distributor belt spikes. The said distributor and spikes, and the removable or adjustable hopper bottom combine to effect or form a feed regulating means without the usual change speed gearing hitherto required in gin feeders.

Under normal operating conditions, the link belt operates over sprockets rotatably fixed at each end of the pivotally supported bottom. The link belt moves the cotton longitudinally along the bottom toward the adjustable end of the latter. Just beyond the movable end of the hopper there operates a picker cylinder at high speed. The cotton advancing longitudinally along the hopper bottom comes into contact with the spikes of the picker cylinder and is driven forcefully downward in a thin rapid stream through an opening in the top of the feeder casing and on to the feeder drum at the middle of its length, whereat is fixed an elliptical ring, one side of which flings the cotton to the left, while the other, in turn, flings cotton to the right, thus dividing the cotton into two equal portions, half to the right and

half to the left. Each half portion of the divided cotton moves entirely around the revolving drum against the surrounding wire mesh a number of times before it reaches the ends of the feeder, whereat cotton outlets are arranged to permit the cleaned cotton to be flung out by the feeder drum in two streams, one from the right and one from the left, each moving toward the opposite end of the feeder apron in a downward curve effecting a normal feed along over the length of the ginning elements.

It is believed that this comprehensive outline description of the machine will facilitate a ready understanding of the more detailed description to follow.

Proceeding with the structural details of the invention, there is provided a distributor belt A, of the conventional nature, to which is fixed rows of spikes, as shown particularly in Figure 6, and which delivers the cotton into the hopper 1 situated upon the main cleaner housing, generally referred to by the character 2 in the different drawings. It will be noted, especially in Figures 3 and 5 that within this hopper a conveyor is provided, which in the present case consists of a link belt 3, having spaced blades 4. This link belt travels around the hopper bottom 5, which latter, as apparent in Figure 3, has its lowermost end supported by a transverse shaft 6, extending through the walls of the hopper 1. The uppermost end of the bottom 5, with its attachments is free so as to be capable of movement up and down as mentioned heretofore. The movement is accomplished by raising and lowering a lever 7 extending alongside the wall of the hopper 1, as apparent in the Figure 5. Connection between the lever 7 and hopper bottom 5 is provided by an L shaped member 8, as particularly apparent in Figure 5, the said member having one end affixed to a transverse non-rotatable shaft 9, extending through castings 10*a* attached to the board 5. The said L shaped member being operative in a slot 10 in the wall of the hopper casing 1.

The link belt 3 runs over sprockets 11, one of which is mounted forwardly of the board 5, the other being mounted upon and driven by shaft 6, which latter, by reason of the intermeshed relationship of gear 12 mounted thereon with gear 13, mounted upon shaft 14, drives the latter shaft upon which is mounted sprocket wheel 15 for driving the link belt 16, which likewise drives the sprocket 17 and its shaft 18. Mounted upon this shaft 18 interiorly of the hopper 1 is a picker roll 19, which is rotated by the aragement just described, that is, through link belt 16.

Within the gear box 20 is a worm gear that effects rotary movement of the shaft 6 and sets in motion all the gears, sprocket wheels and link belt, the small picker roll all and severally as just described. The beater drum shaft 21 drives pulley 23, situated upon the gear box shaft 24, through the medium of belt 22, encircling the pulley 25. The pulley 26 is provided as a guide for the belt 22. The shaft 27 is rigidly fixed to the end casting of the housing 2. A loose pulley 28 is carried by an arm 29 pivoted upon a rigidly fixed shaft 30.

It should be understood that the weight of the parts 28 and 31 is sufficient to maintain operative tension on the belt 22, but the feeding and cleaning operation will stop when the lever 31 is moved inwardly until the recess 31*a* is engaged by the bracket 31*b*, at which time the tension on belt 22 will be lessened to such an extent that its friction will not be great enough to drive the elements of the machine.

It is apparent from the foregoing that the cotton deposited into the hopper will be moved longitudinally along the support or movable bottom 5 toward the picker roll 19. As the cotton comes in contact with the spikes of the picker roll or picker cylinder, as it is sometimes called, it is beaten downward in a thin rapid stream through the opening B in the top of the casing 2, as shown in Figures 3 and 5, and onto the beater drum 32 at the middle of its length.

The cleaner assembly includes the beater drum 32, which is particularly shown in Figure 5 in cross section, and consists of a cylinder having a multiplicity of studs 33 protruding therefrom and arranged in spaced relationship. This drum is in the confines of a foraminous case 34, and is driven from the large drive pulley 35, situated upon the end of the drum shaft 21.

As apparent in Figure 3, the drum 32 has affixed thereto, near its center an elliptic ring 36, one side of which flings the cotton to the right hand and the other side in turn flings it to the left. It is obvious that the position of the ring on the drum is such that the effect will be to impart to the cotton entering the cleaning area, a sidewise movement, throwing a portion thereof to the right and a portion to the left, whereupon each portion is carried rapidly around the foraminous case 34 by the studs 33 on the drum.

In Figure 4 is shown the underside of the cover 37 of the housing 2, with the central inlet 38 through which the cotton enters the feeder proper. At each side of the inlet 38 are spaced, angularly arranged deflector blades 39, their relationship with the beater drum 32 being shown in Figures 3 and 5. It will be noted that the blades on one side of the opening 38 are arranged at an angle opposite to those on the other side of the opening, consistent with the right and left hand effect of the elliptical rings 36 encircling the drum 32.

With further brief reference to the foraminous case, it may be seen in Figure 5 that the case is made in two sections, the foremost section being supported and held in operative relationship with the drum 32 by ribs 40, fixed to the front wall of the housing 2, while the rear section is correspondingly held by ribs 41, the lower ends of the two rib assemblies abutting at a point near the base of the cleaner. The rear section is capable of being opened outward by reason of the pivotal engagement at 42 of the upper end of the rib assembly to the housing. This arrangement affords ready access to the drum or other parts within the confines of the housing 2. A handle 43 and a pair of latches 44 are provided near the lower end of the rear section.

At the bottom of the housing 2 is a longitudinal trough 45 which accommodates a screw conveyor 46 upon a shaft 47 which may be driven by any suitable means. This conveyor is arranged to expel the trash sifted from the cotton.

The feeder apron 48 at the front of the housing 2 is of a conventional nature, having the usual adjustment 49 provided with hinges 50. This apron is adapted to receive the cleaned cotton as it is delivered in stream like formation from each end of the feeder drum 32. The cotton is flung upwardly by the radial fins 51 shown in Figure 3, against the inclined wall portion 53 wherefrom it is delivered in intercrossing streams as indicated by the arrow lines.

To those versed in the ginning art it is a matter of common knowledge that the present prevailing cotton distributing devices that supply cotton to the gin feeder hopper, effect a packing of the cotton densely at one end of the feeder hopper and leave the other end quite loosely filled. The ends of the gin breast or roll box of the gin therefor receive the cotton in the same unequal quantities in which the distributor devices deposit it in the hoppers and this characteristic of gin feeding operations is at this time quite universal. That sort of feeding for cotton gins is quite opposed to what it should be to get the best results in ginning operations.

The feeder of this invention will supply the cotton in even quantities to each end of the roll box or breast of the gin regardless of how the cotton may be deposited in the feeder hopper and this is nothing less than the ideal long desired.

Having described the construction of the improved feeder, the operation as effected by the improved construction will be now set forth.

The cotton entering the hopper 1 by way of the distributor belt A rests upon the support 5 and is moved there along by the blades 4. The cotton thus advancing comes in contact with the picker fingers of the small high speed picker roll 18 whereby is effected a rapid downward movement of the cotton through the opening B onto the middle portion of the feeder drum 32, into contact with helicoid ribs 36, which divides the cotton into equal portions, sending one portion to the right and one to the left, in contact with the studs 33. These studs set up rapid rotary movement in the cotton over the inner walls of the foraminous case 34. The cotton in its rapid circular movements is kept in contact with deflector blades 39 and caused thereby to continuously advance toward the ends of the beater drum from whence it is thrown out through outlets 53 at either end of the drum, issuing from the outlets in loose intercrossing streams. The cotton in falling is spread over the length of the feeder apron 48 which directs it normally into the roll box C of the gin.

In the course of the ginning operation, the feeder may be stopped or started as required from time to time by the movement of the lever 31 inwardly for stopping and outwardly for starting the feeder.

It is understood of course, that the cotton in being discharged upwardly with considerable impetus by the beater drum fins 51, strikes the surface 52 arranged at an incline and is deflected onto the apron. The particular discharging means described herein is especially desirable because it effects a universally much desired full feed at the ends of the roll box.

In order to enable the operator to observe the performance of the interior mechanism of either the hopper 1 or cleaner housing 2, windows 54 are provided both in the housing 2 and on either side of the hopper 1.

What is claimed is:—

1. A cotton cleaning gin feeder having a receiving hopper with an outlet at its end, a foraminous case with a cotton inlet midway of its ends corresponding with the outlet of said hopper and having delivery outlets adjacent its ends, a rotatable cylinder in said case for processing the cotton toward the outlets and effecting its uniform discharge into the ends of a gin roll box.

2. A cotton cleaning gin feeder having a receiving hopper with an outlet at one of its ends, a foraminous case with a cotton inlet midway of its ends communicating with said outlet and having delivery outlets adjacent its ends, a rotatable cylinder in said case for processing the cotton toward the outlets and effecting its discharge therethrough in streams, and means for directing said streams in opposite directions toward opposite ends of said feeder whereby to effect a normal feed into the ends of the roll box of a gin.

3. A cotton cleaning gin feeder organized and arranged for receiving cotton and having means for processing said cotton for cleaning through a series of rapid rotary

movements in the confines of a foraminous case toward outlets adjacent the ends of said case and means for discharging said cotton in streams toward opposite ends of said feeder.

4. A cotton cleaning gin feeder organized and arranged for receiving cotton and having means for processing said cotton for cleaning through a series of rapid rotary movements in the confines of a foraminous case toward outlets adjacent the ends of said case and means for discharging said cotton in loose intercrossing streams toward opposite ends of said feeder in a manner to effect normal delivery of said cotton to the ginning elements.

5. A cotton cleaning gin feeder organized and arranged to process the cotton for cleaning by receiving it through an opening midway of the ends of said feeder and subjecting it to a series of rapid circular movements, a foraminous case in which said cotton is processed having peripheral outlets adjacent its ends and means for directing the discharged cotton toward opposite ends of said feeder for normal delivery thereof into the ginning elements.

6. In an apparatus as described in claim 1, a rotatable cylinder having a substantially elliptical flange surrounding and fixed to its periphery midway of its ends.

7. In an apparatus as described in claim 1, a quantity separating unit including a rotatable cylinder and a substantially elliptical flange surrounding the cylinder whereby portions thereof will overreach a diametrical line drawn midway of its ends.

8. Apparatus as described in claim 1 including a quantity separating element comprising a rotatable spiked cylinder, a flanged member of substantially elliptical form arranged on said cylinder whereby portions thereof will overreach the middle of said cylinder to cast material falling thereupon in opposite directions at each half revolution of said cylinder.

STEPHEN D. MURRAY.