April 19, 1938. B. C. WOODFORD 2,114,552

FEEDER, EXTRACTOR, AND CLEANING MACHINE FOR COTTON GINS

Filed June 11, 1936

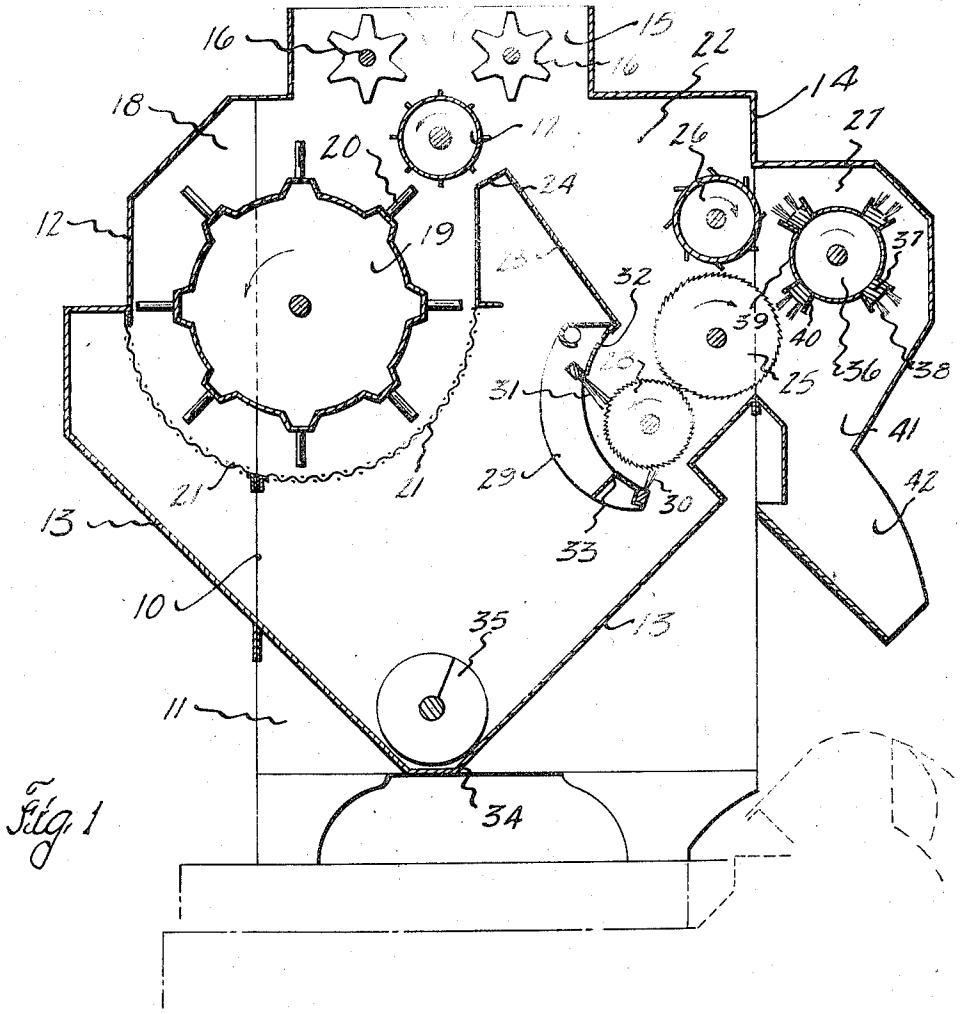


Fig. 1

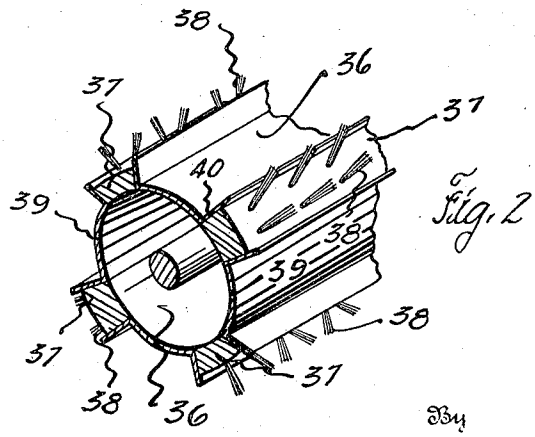


Fig. 2

Inventor
BRONSON C. WOODFORD

By

Attorney

Patented Apr. 19, 1938 2,114,552

UNITED STATES PATENT OFFICE

2,114,552

FEEDER, EXTRACTOR, AND CLEANING MACHINE FOR COTTON GINS

Bronson C. Woodford, Dallas, Tex., assignor to The Murray Company, Dallas, Tex., a corporation of Texas

Application January 11, 1936, Serial No. 58,646

3 Claims. (Cl. 19—37)

This invention relates to new and useful improvements in feeder, extractor, and cleaning machines for cotton gins.

One object of the invention is to provide an improved extractor-cleaner feeder for cotton gins.

An important object of the invention is to provide a machine of the character described wherein an improved arrangement and association of parts and elements, makes for increased efficiency, simplicity of structure and reduction in number of parts.

Another object of the invention is to provide an improved cleaning arrangement, whereby more effective cleaning is performed prior to the extracting operation.

A further object of the invention is to provide an improved brush mounting, whereby the brushes for feeding the lint cotton to the lower saw cylinder may be swung to compensate for wear of the brushes and to properly adjust said brushes with relation to said saw cylinder.

Still another object of the invention is to provide an improved revolving brush, whereby double rows of bristles may be employed at each flight and a more stable brush produced.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing in which an example of the invention is shown, and wherein:

Figure 1 is a transverse, vertical sectional view of a machine constructed in accordance with the invention, and

Figure 2 is an enlarged isometric view of the revolving brush.

In the drawing, the numeral 10 designates the case or housing of the machine which may be of any approved construction; however, it is preferable to form the machine with upright end members 11, which may either be cast or made of sheet metal pressed to shape. A front section 12, a bottom section 13 and a back section 14 of the housing may each be formed of sheet metal and disposed longitudinally between the end members to form a complete enclosure. It is not considered necessary to go into the details of the housing structure as the same involves well known manufacturing expedients and such details are not essential to the invention.

A hopper 15 is formed at the top of the housing for receiving seed cotton from the distributor, or any other source of supply. A pair of feeding rolls 16 are mounted in the hopper on opposite sides of the longitudinal center of said hopper and are spaced apart sufficiently to provide an ample gap for receiving and feeding the cotton downwardly. These rolls are preferably star-shaped and rotate toward each other and downwardly. They are revolved very slowly so as to regulate the feed of the cotton and prevent choking.

At the bottom of the hopper and intermediate the rolls 16 is a kicker-roller 17, of the usual type, which revolves in a counter-clockwise direction so as to cast the cotton into a cleaning chamber 18. The kicker-roller is close enough to the rolls 16 to engage the cotton as it is discharged by said rolls and to co-act particularly with the left hand roll 16 and thus tend to separate the cotton locks. This kicker-roller revolves very rapidly and many times faster than the feed rolls.

A cleaning roller 19 is journaled in the cleaning chamber and is of the usual construction having spikes 20. The bottom of the cleaning chamber is formed by a semi-circular screen 21, which is preferably made of wire mesh suitable for the purpose. The screen is disposed concentrically to the roller 19 so that the boles and cotton locks will be carried in a continuous path over the surface of said screen. The spikes 20 pass in close proximity to the kicker-roller 17 and revolve in an opposite direction to the opposed circumferential travel of the latter, so that cotton carried up the rear side of the chamber 18 is kicked by the roller 17 out of said chamber at the top of the rear side thereof. The spikes co-act with the screen in breaking up the dry boles and also have a tendency to open the boles and separate the locks when engaging the mass of cotton.

The cotton is cast into an extracting chamber 22 at the rear of the housing by the kicker-roller 17. The chambers 18 and 22 are separated by a longitudinal bridge 23 having an upwardly inclined top 24. The cotton and opened boles discharged to the roller 17 by the roller 19 will be carried by said roller 17 up the inclined surface 24, whereby further separation of the locks and further bole breaking will be accomplished. At the bottom of the extracting chamber a saw cylinder 25 is journaled and above this cylinder is a stripper-roller 26 revolving in the same direction as the saw cylinder. It will be seen that the stripper-roller, in passing over the saw cylinder, will tend to strip excess cotton and foreign

matter from the said cylinder and cast it back into the extracting chamber, while the cotton lint remaining on the saws will be carried rearwardly into a brush chamber 27. Mostly trash, shale and the like will be stripped by the roller 26 from the cylinder 25, however, some lint cotton will be stripped by said roller.

The bottom of the extractor chamber 22 is open to a restricted extent and the stripped materials, as well as a portion of the bolly cotton, will pass downwardly through the bottom of said chamber. A second saw cylinder 28, preferably smaller than the cylinder 25, is disposed immediately below the latter and forwardly of the shaft of the cylinder 25 so as to underlie the open bottom of the chamber 22. The saw cylinder 25 revolves in a clockwise direction, while the cylinder 28 revolves in a counter-clockwise direction. From this, it would be obvious that any lint cotton carried by the lower cylinder 28 will be picked up by the saws of the upper cylinder 25.

A hull member 29 extends downwardly from the bridge 23 in front of the saw cylinder 28. This member carries a brush 30 at its lower end including a single row of bristles and disposed so that the ends of the bristles engage the saw teeth in the under side of the cylinder. A second brush 31, similar to the brush 30, is carried by the upper portion of the member so as to engage the teeth of the lower saw cylinder above the plane of its shaft. These brushes extend the length of the cylinder, as is the usual practice.

The member 29 carries a curved apron 32, extending from the upper brush 31 to the lower end of the rear side of the bridge 23. A second apron 33 extends from the brush 30 upwardly of the member 29 far enough to catch and retain locks of cotton which may fall from the cylinder 28. The brushes act to arrest the lint cotton and feed it to the teeth of the cylinder 28, permitting the dust and fine trash to sift between their bristles. The member 29 is pivoted at its upper end whereby it may be swung to adjust its brushes to the saw cylinder.

It will be noted that the bottom section 13 of the housing has a hopper shape and the screen 21 is located over the inclined front side of said hopper, while the cylinder 28 and member 29 are located over the rear inclined side of said bottom section. By this arrangement the trash, dirt, hulls and the like, which fall upon these inclined bottom portions, are carried downwardly to a conveyor trough 34 at the extreme bottom of said section. A screw conveyor 35 is located in this trough and extends longitudinally through the machine so as to carry off the waste matter. The hopper is unobstructed and fine matter, such as dust, leaf trash and shale which sifts through the screen 21 is given full opportunity to settle into the trough 34. There is also ample clearance between the member 29 and the screen 21.

A brush cylinder 36 is mounted longitudinally in the chamber 27 and the particular structure of the brush is rather important, being shown in detail in Figure 2. This cylinder is provided with longitudinal brush bars 37, each bar carrying two rows of bristles 38. Curved cover sheets 39 are fastened on the cylinder and have flanges 40 bent outwardly to form sockets in which the bars 37 are received.

The bars 37 are made wedge shaped so as to snugly wedge into the sockets between the flanges 40, whereby said bars are securely supported. These bars may be fastened to the cylinder in any suitable manner. It will be noted that the flanges 40 extend outwardly beyond the bars on each side of the bristles. This structure has several advantages. Cotton will sometimes collect in more or less dense masses in the space between the brush and the cylinder 25 and the stripper-roller 26. The wide crotches between the brush bars prevent choking and the outwardly extending flanges give the brush sufficient stability to move the cotton. The bristles will be protected and will not be deflected as much as if the flanges were not used, therefore a more efficient brushing action will be obtained. The flanges will further provide an increased fan action.

The brush 36 is located so that the brush bristles 38 will brush the lint from the saws of the cylinder 25 and discharge it into a hopper 41 at the bottom of the chamber 27. These bristles also pass in close proximity to the stripper-roller 26, thus keeping it from becoming overloaded. A chute 42 extends from the hopper 41 for delivering the seed cotton to the gin stand, in the usual manner.

In operation, the bolly cotton is delivered to the feed rolls 16 in the hopper 15, in the usual manner, and carried downwardly between said rolls onto the kicker-roller 17. The best performance is had by revolving the roller 17 at a much higher rate of speed than the rate at which the feed rolls are revolved. As an illustration and without limitation, good results have been had by revolving the rolls 16 at about 5 R. P. M. and the kicker-roller 17 at about 400 R. P. M.

The fast moving kicker-roller 17 will tend to stratify the cotton mass, thereby separating the locks and casting the cotton and unbroken boles, or partially opened boles into the chamber 18 in the path of the spikes 20 of the cleaner roller 19. The cotton will be carried downwardly at the front of the chamber and over the screen 21 by these spikes; it being preferable to revolve the roller 19 at the same rate of speed as the roller 17. The apparatus in the chamber 18 not only acts as a cleaner but also as a bole breaker. The dust, fine leaf trash and shale will sift through the screen 21 and pass downwardly in the hopper bottom 13 to the trough 34.

The cotton which has been treated in the chamber 18 will be carried upwardly against the front side of the bridge 23 into contact with the under side of the kicker-roller 17, which will move it up the incline 24 and cast it into the extracting chamber 22. The cotton, in passing between the roller 17 and the bridge 24, will again be stratified and loosened. The cotton which is cast into the chamber 22 will be substantially clean except for hulls and larger particles of trash which may adhere thereto.

The cotton passes down the bridge 23 and is fed to the saws of the cylinder 25 and carried upwardly toward the stripper-roller 26 which acts to strip from such cotton hulls and particles of trash, casting them back into the chamber 22. Seed cotton, which is carried by the cylinder 25 into the chamber 27, is stripped off by the brush 36 and falls into the hopper 41 from which it passes by way of the chute 42 to the gin stand.

The hully cotton, from the chamber 22, will fall down through the bottom of the said chamber onto the saw cylinder 28 and will be carried downwardly by said cylinder through the brushes 30 and 31. This operation will extract the remaining hulls and trash which will fall into the bottom 13 and finally be caught in the trough 34.

The conveyor **35** will, of course, carry off all of the foreign matter collected in the trough. The cotton which is fed to the saw cylinder **28** by the brushes, as well as the cotton which clings thereto, will be carried by said cylinder upwardly and stripped off by the oppositely revolving saws of the cylinder **25**. In order to secure the best results, the cylinder **25** is revolved at a higher rate of speed than the cylinder **28** and the stripper-roller **26** is revolved at a much higher rate of speed than the cylinder **25**. The brush cylinder **36** is revolved at a faster rate of speed than the saw cylinder **25**, but not as rapidly as the stripper-roller.

What I claim and desire to secure by Letters Patent, is:

1. A machine of the class described including, a housing having a hopper bottom provided with a discharge conveyor at its bottom, the front and rear sides of the housing bottom inclining continuously to said conveyor, a cleaning chamber in the housing overhanging the front portion of the hopper bottom, an extracting chamber at the rear of said cleaning chamber and overhanging the rear portion of the hopper bottom for receiving the cotton from the cleaning chamber, a pair of saw cylinders arranged one above the other and receiving the cotton in the extracting chamber, an arcuate hull member hingedly mounted at its upper end at the bottom of the extracting chamber and above the lower saw cylinder with its lower end terminating substantially diametrically below said saw cylinder, said hull member carrying upper and lower brushes and a separate cooperating apron leading to each brush to feed cotton to the lower saw cylinder.

2. A machine of the class described including, a housing having a hopper bottom provided with a discharge conveyor at its bottom, the front and rear sides of the housing bottom inclining continuously to said conveyor, a cleaning chamber in the housing overhanging the front portion of the hopper bottom, an extracting chamber at the rear of said cleaning chamber and overhanging the rear portion of the hopper bottom for receiving cotton from the cleaning chamber, a pair of superimposed saw cylinders receiving the cotton in the extracting chamber, the lower one of said saw cylinders being located at the bottom of said extracting chamber and the upper one, in cooperation with a superimposed stripper roller, separating said extracting chamber from a brush chamber at the rear thereof, a rotating brush in said brush chamber acting on the upper saw cylinder to brush cotton therefrom, an arcuate hull member hingedly mounted in the housing at its upper end and above the lower saw cylinder, with its lower end terminating below said lower cylinder, said hull member carrying a pair of brushes one of which is located above and the other below the axis of said lower saw cylinder, and separate upper and lower aprons on said hull member leading respectively to said brushes for feeding cotton to said lower cylinder.

3. The herein described cotton cleaning machine comprising a housing having a hopper-like trash receiving chamber in its lower portion, the front and rear side walls of the chamber inclining downward continuously and uninterruptedly convergent to a transverse trash conveyor at its bottom, an initial cleaning chamber located directly above the forward upper portion of the trash receiving chamber and open at its rear top portion to communicate with the feed inlet of the machine and having a semi-cylindrical trash sifting screen constituting its bottom and the forward dividing top wall of the trash receiving chamber, an extracting chamber located directly at the rear of said initial cleaning chamber and above said trash receiving chamber, said extracting chamber having an opening in its bottom portion communicating directly with the rear upper portion of the trash receiving chamber, said initial cleaning chamber and the extracting chamber being divided by a bridge extending transversely of the machine housing and having a rearwardly and upwardly inclined top portion defining the bottom of a direct communicating opening between said initial cleaning chamber and the extracting chamber, a vertical front portion extending downward from the lower forward end of said inclined top portion and merging tangentially at its lower edge with said trash sifting screen and constituting the rear wall of the initial cleaning chamber, and a rear portion extending inclinedly downward from the upper rear end of said inclined top portion whereby to constitute a front hopper bottom wall for the extracting chamber and terminating at its lower edge at the opening between the extracting chamber and the trash receiving chamber, a circumferentially spiked roller of an overall diameter approximately that of the cleaning chamber, a kicker-roller located directly above the rear portion of said spiked roller and forward of the top of said bridge, said kicker-roller being circumferentially close to said spiked roller and restrictedly spaced at a greater distance from the forward top corner of the bridge, both of said rollers rotating in the same direction with their upper portions travelling forwardly and downwardly and their lower portions rearwardly and upwardly whereby the material fed to the machine is initially carried forwardly over said spiked roller, thence downwardly, rearwardly and upwardly between the roller and the front wall, semi-cylindrical bottom screen and vertical rear wall of the cleaning chamber and back to the kicker-roller where it is deflected by the kicker-roller into the extracting chamber, and hull extracting, stripping and doffing means located at the rear of the extracting chamber.

BRONSON C. WOODFORD.