Jan. 11, 1938. R. E. McLEMORE 2,104,881

VACUUM WHEEL

Filed April 26, 1937

Fig. 1.

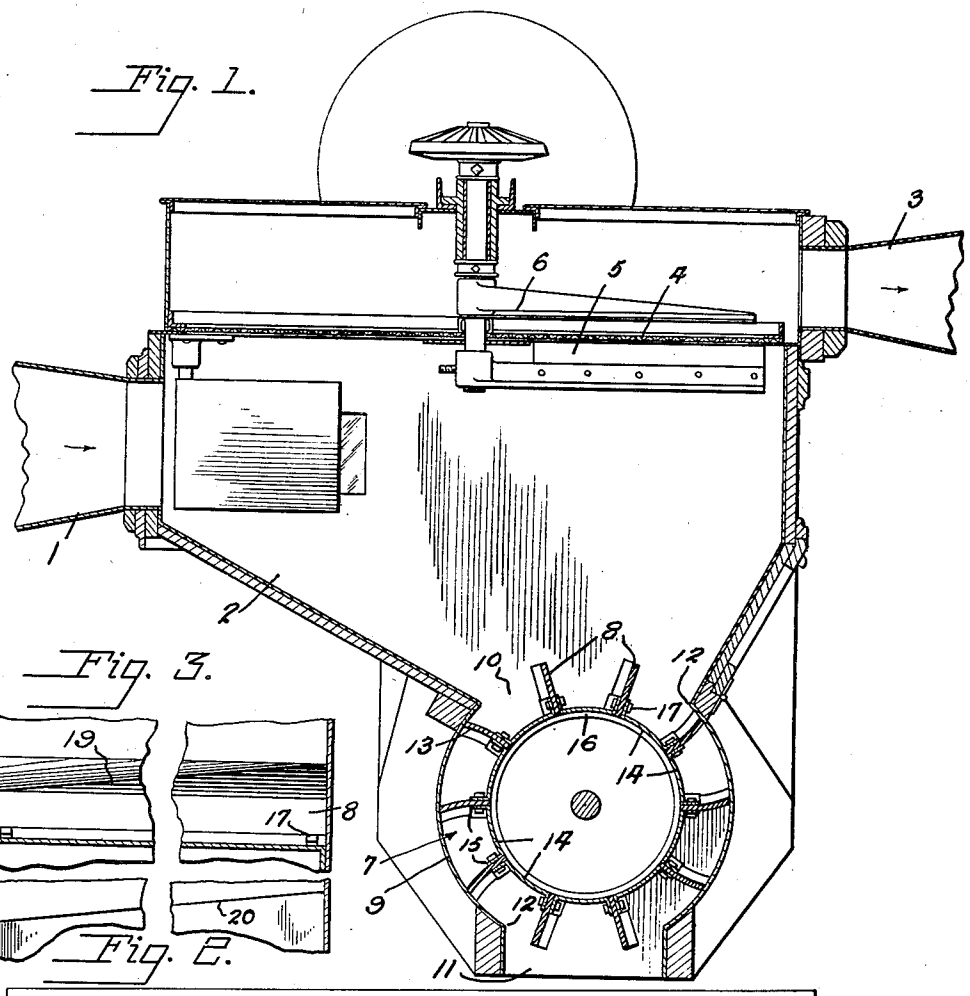
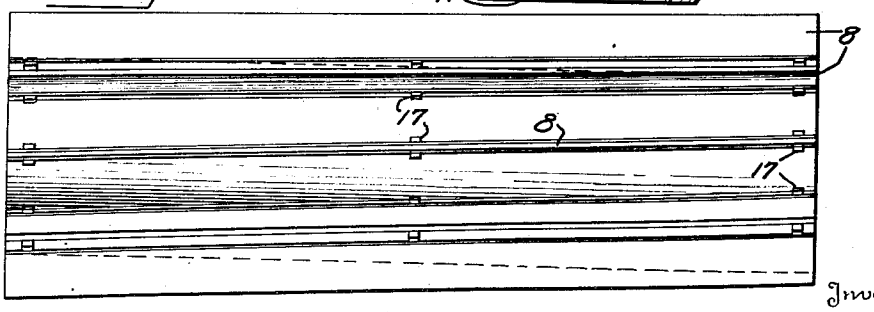


Fig. 3.

Fig. 2.



Inventor.

R. E. McLemore

By Mason Fenwick & Lawrence

Attorneys

Patented Jan. 11, 1938

2,104,881

UNITED STATES PATENT OFFICE

2,104,881

VACUUM WHEEL

Robert E. McLemore, Columbus, Ga., assignor to Lummus Cotton Gin Co., Columbus, Ga., a corporation of Georgia

Application April 26, 1937, Serial No. 139,049

1 Claim. (Cl. 19—75)

This invention relates to the promotion of noiselessness in the operation of cotton treating machinery and particularly that part of the process of preparing cotton which is associated with the ginning.

It is common practice to convey the cotton from the truck, to the gin, cleaner, separator, etc., through a conduit by means of a vacuum-induced air blast, and at every point in the conduit where the cotton must be dropped out to be operated upon by a unit of the cotton-treating system, it must be passed through a vacuum lock, otherwise it could not be delivered outside of the vacuum conduit, but would be sucked back together with air from outside, when the conduit was opened to atmosphere.

The vacuum lock usually comprises a flexible bladed wheel mounted in a casing opening on the one hand to the vacuum conduit, and on the other to the apparatus to be served with cotton.

The flexible blades of the wheel necessarily collide or make sweeping contact with the surrounding wall of the casing to seal in the vacuum, the cotton collecting between the blades of the wheel and being passed from within the evacuated region to the outside of that region.

Contact of the flexible blades with the adjacent wall of the casing makes a loud slapping noise as the vacuum wheel rotates and since there are at least several of these air locks in most ginning installations, the operation of the machinery is quite noisy.

The present invention has for its object to provide a modification in the structure of the vacuum wheel by means of which the noisiness thereof is practically eliminated.

Other objects of the invention will appear as the practical and preferred embodiment thereof proceeds.

In the drawing throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a longitudinal vertical section through a separator, employing a vacuum lock embracing the features of the present invention between the separator and an under-located cleaner, (not shown);

Figure 2 is a longitudinal elevational view of the vacuum wheel; and

Figure 3 is a fragmentary sectional view showing a modification.

Referring now in detail to the figures, the numeral 1 represents the anterior or inlet end of an air conduit, serving the separator 2 which separates air from the cotton flowing through said conduit. The posterior or outlet portion of the conduit is represented by the numeral 3.

Between the inlet and outlet portions of the vacuum conduit is a screen 4 adapted to effect the separation of the air which passes through the screen and exits by way of the posterior portion 3 of the conduit and the cotton which collects against the underneath surface of the screen 4 and is wiped off by the rotating wiper 5. A damper 6 is positioned above the wiper 5 and on the opposite side of the screen above said wiper, and rotatable therewith, the object of the damper being to maintain a local area of the screen above the damper which is relieved from the vacuum, permitting the easy removal of the cotton by the wiper. The cotton drops upon the peripheral surface of the vacuum wheel 7 which is drum-shaped as shown in Figure 2, between the blades 8 of said vacuum wheel.

The vacuum wheel is rotatably mounted within a casing 9, said casing being open at 10 to the chamber of the separator which is in fact part of the vacuum conduit, and the lower portion of the casing is open as at 11 to the atmosphere, in connection with the cleaner or any other piece of apparatus that may be beneath the vacuum wheel.

The blades 8 are made of flexible material such as rubber and of such length that they collide with the advance edge 12 of the casing 9 so that they bend slightly against the peripheral portion of the casing as indicated at 13 in Figure 1 and thus form a seal between the region of subatmospheric pressure within the separator and the region of higher pressure adjacent the opening 11 of the casing 9.

The arcuate portions of the casing 9 against which the ends of the blades 8 sweep are of sufficient length to permit several blades on each side of the vacuum wheel to be in contact with them at the same time and thus to maintain at all times a seal between the vacuum conduit and atmosphere.

The cotton dropping upon the wheel 7 between the blades 8 is carried by the rotation of the vacuum wheel from within the vacuous atmosphere of the separator to the opening 11 where it is no longer subject to the vacuum, but free to fall by gravity into the underlying machine. The vacuum wheel rotates at a suitable speed such as for example, 120 revolutions per minute so that the cotton dropping upon the vacuum wheel 9 is continuously carried to the outside of the vacuum conduit and that without loss of vacuum.

It is customary in vacuum wheels to have the flexible blades extend across the surfaces of said wheels in a direction parallel to the axis of rotation of the wheel so that the entire width of the blade strikes against the edge **12** of the casing, making a substantially continuous and loud slapping noise. I have discovered after much experimentation that this noise can be practically eliminated by a slight modification in the construction of the vacuum wheel. Figure 1 shows that the periphery of the vacuum wheel is made up in the form of arcuate sections **14** of sturdy sheet material having outwardly extending lugs **15** at their ends and that these sections are secured to an underlying cylindrical frame **16** in such a manner as to space the lugs **15** of the adjacent sections a slight distance apart. In this space the base of the flexible rubber blade **8** is inserted, being secured by bolts **17** passing through said lugs and the rubber and clamping the rubber in place. In known constructions the lugs **15** extend parallel to the axis of rotation of the vacuum wheel, but in my invention the lugs are arranged slightly oblique to the direction of axis of rotation of said wheel so that the blades are also oblique as shown in Figure 2. By this construction, the advance end of the edge of the flexible blade engages the casing first, and the rest of the edge will gradually be bent and follow in. This does not make the solid impact as is produced when the blades must strike their full length against the casing as in common practice and consequently the noise of their operation is practically eliminated.

A variant of the construction and which amounts to a reversal of parts is to have the blades mounted parallel to the axis of rotation of the vacuum wheel as in conventional constructions, but to have the entering edge of the casing inclined upwardly from one end to the other as shown at **19** in Figure 3, and the discharge edge also inclined as shown at **20**, so that the blade in entering will strike one end only of the edge of the casing, and progressively extend its contact with the rest of said edge as it rotates into the cylindrical part of the casing, and in leaving it will straighten up progressively, from one end.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of the invention, it will be understood to those skilled in the art that the details of construction and arrangements of parts are by way of example and not to be construed as limiting the scope of the invention as defined in the appended claim.

What I claim is:

Vacuum lock comprising a cylindrical casing having openings extending across opposite sides, the side walls of said openings being parallel to the axis of said casing, a rotor mounted coaxially in said casing including flexible extending vanes having their free edges parallel to the axis of the rotor and of such radial length as to engage the cylindrical wall of said casing for sealing it against pneumatic pressure, said vanes having their peripheral edges slightly oblique with respect to the direction of the axis of the rotor whereby the leading end of each vane will first make contact with the walls of the openings on the advance side with respect to the direction of rotation of said rotor, the entire peripheral edges of the vanes thus progressively coming into contact with said walls.

ROBERT E. McLEMORE.