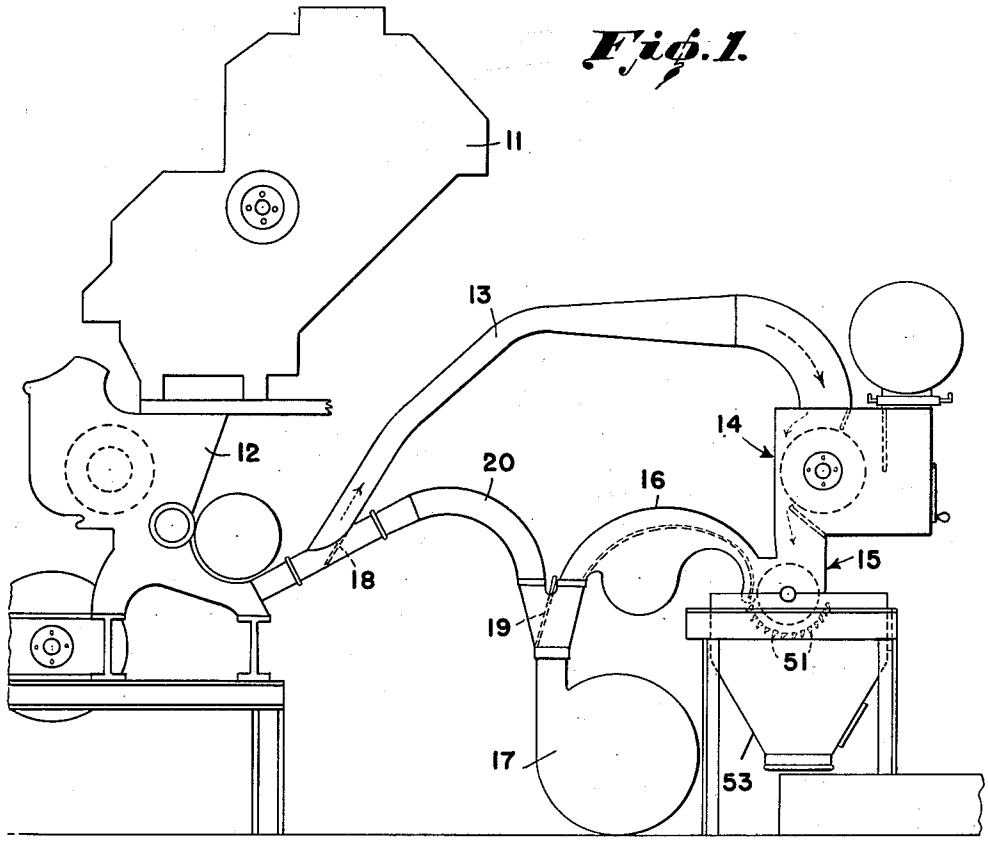
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LINT COTTON CLEANER

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Fig. 1.



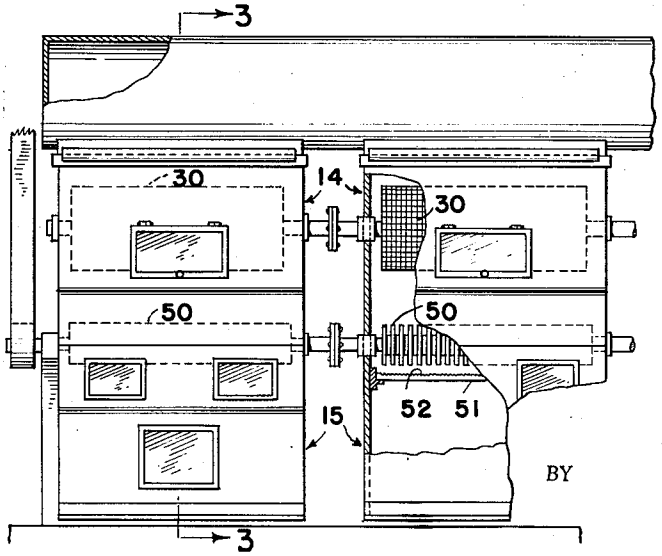


Fig. 2.

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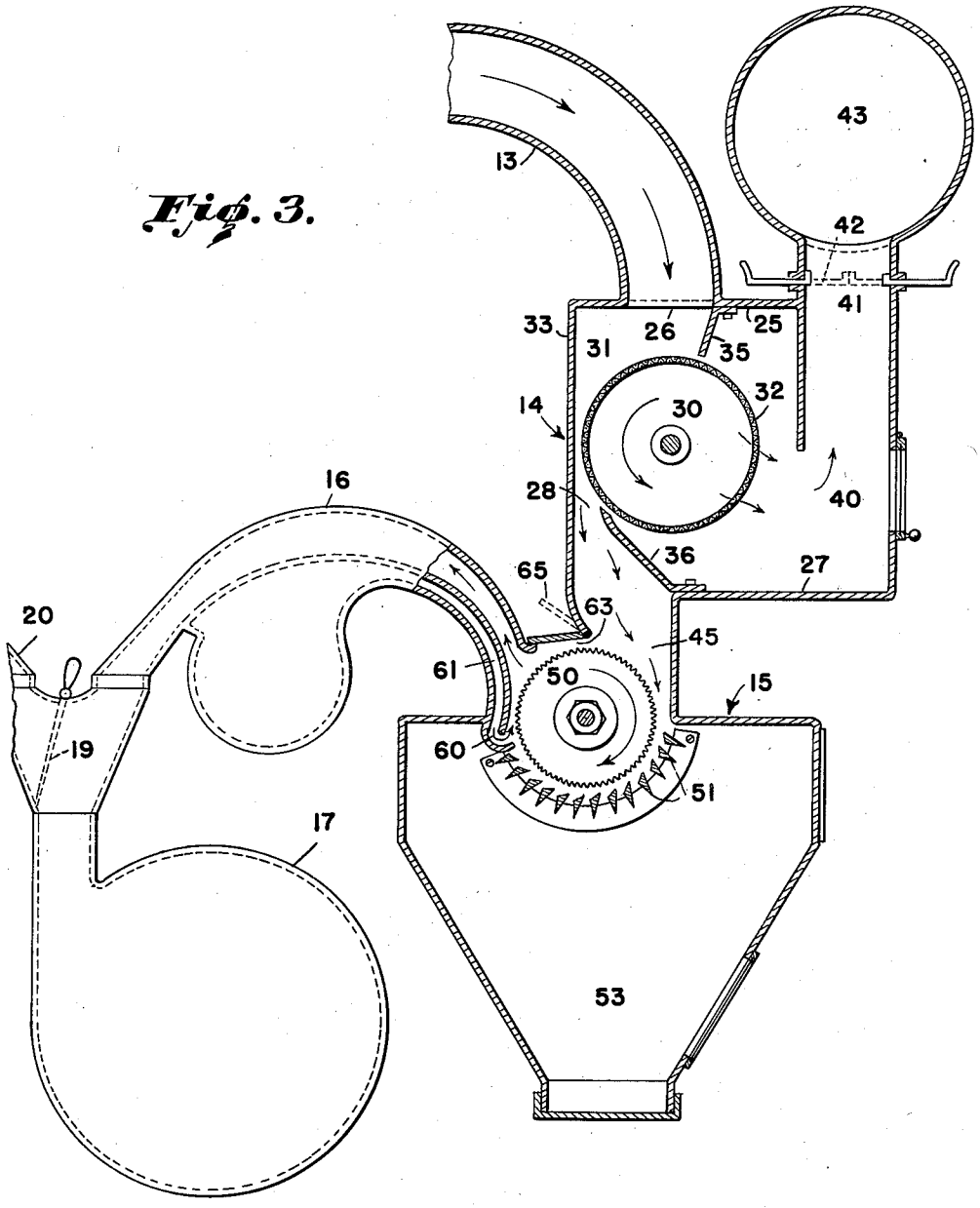
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Fig. 3.



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UNITED STATES PATENT OFFICE

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LINT COTTON CLEANER

Victor Leo Stedronsky, State College, N. Mex., and Charles S. Shaw, Leland, Miss., dedicated to the free use of the People in the territory of the United States

Application March 21, 1950, Serial No. 151,024

1 Claim. (Cl. 19—72)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention herein described may be manufactured and used by or for the Government of the United States of America for governmental purposes throughout the world, without the payment to us of any royalty thereon.

We hereby dedicate the invention herein described to the free uses of the people in the territory of the United States to take effect on the granting of a patent to us.

In a cotton-processing system, cotton lint is frequently conveyed through an air duct by an air current from one stage of processing to another. In a conventional system, the cotton is thus conveyed from the cotton gin to a condenser preceding packaging, and it is known to interpose a lint cotton cleaner en route.

A cleaner for this purpose is shown and claimed in an application by Sawyers and Pugh, filed August 12, 1949, Serial No. 110,014, the cleaner therein described in general having a casing in which is housed a rotatable beater cylinder provided with radially extending beater spikes running near to a concave formed from spaced bars provided with comb teeth adjacent the beater spikes. The cotton lint is delivered to and conveyed through the cleaner by air currents, the lint being combed over the comb teeth with dislodged foreign matter being expelled between the spaced bars. The arrangement is such that the entire volume of air conveying the lint from the air duct flows through the cleaner and this together with the action of the rotatable beater cylinder makes the passage of the lint essentially solely by air current with the possibility that a portion of lint may pass between the beater spikes without being combed over the comb teeth, resulting in comparatively inefficient smoothing and cleaning benefits.

In other known types of cleaners the lint is first condensed and then fed onto the rotatable cylinder by passing through rolls located near the cylinder. This system is defective in that the foreign matter may be pressed into the lint again, and an irregularity in delivery of lint from the gin may result in clogging of the cleaner with resultant incomplete separation of the fibers for most effective release of the foreign matter.

The present invention relates primarily to a cleaner of the general type mentioned and means for receiving lint and air from the air duct and for feeding the lint to the cleaner in a manner to obviate the prior art defects above described.

In general, according to the invention, a lint cleaner is provided in a cotton processing system of the type mentioned. The cleaner comprises an essentially air tight casing in which is housed a rotatable cleaning cylinder provided with radially extending saw-tooth-shaped cleaning cylinder teeth on its periphery. The casing also houses a concave formed from spaced bars, preferably provided with comb teeth as disclosed in the Sawyer and Pugh application mentioned, located adjacent the cleaning cylinder.

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Means, later referred to as an air-lint separator, for receiving the lint and air from the air duct of the system, separating a portion of the air therefrom, and feeding the lint and remaining air directly into the cleaning cylinder teeth, is also provided. By regulating the amount of air separated and consequently the amount fed forward with the lint into the cleaner, it is possible to provide a proper amount of air to assure that the lint is kept separated in small tufts as it passes through the cleaner thus to allow free extraction of the foreign matter therefrom regardless of variation in rate of feeding of lint from the gin, and at the same time limit the amount of air so as to avoid by-pass of the lint through the cleaner solely by air current with resultant inefficient removal of the foreign matter.

Preferably the remaining air and lint from the air-lint separator is fed into the cylinder teeth through an inlet port in the casing so as to be carried by the teeth into the concave, and an aspirator port is provided in the casing on the side of the inlet port remote from the region of entry of lint into the concave, an adjustable damper being provided for regulating the exit of air from the aspirator port. Entry of air into the casing tends to raise the pressure and some air will flow directly from the inlet port to the aspirator port. Proper regulation of the damper assists in directing the lint into the cleaning cylinder teeth, thus to aid in avoiding loss of fiber during the cleaning action between teeth and grids.

For a detailed description of the invention, reference is made to the accompanying drawing in which

Figure 1 illustrates schematically a system of the type mentioned, with a lint cotton cleaner and an air-lint separator installed therein;

Figure 2 is a front elevation of the lint cotton cleaner and air-lint separator showing a battery of two similar units in parallel with parts broken away; and

Figure 3 is a section on the line 3—3 of Figure 2.

In Figure 1, 11 indicates a conventional type

seed-cotton feeder and 12 a cotton gin to which the feeder delivers seed cotton.

After ginning, the cotton lint is conveyed by air current through air duct 13 to the air-lint separator 14, thence through lint cleaner 15, from which the cleaned cotton is conveyed by air current through air duct 16 into and through main trunk 17 to the condenser (not shown). Valves 18 and 19 may be provided to close ducts 13 and 16, respectively, and open a duct 20 directly from the gin 12 to the main trunk 17, thus to by-pass the air-lint separator and lint cotton cleaner when desired.

The air-lint separator 14 itself comprises a casing having rectangular side walls. The upper wall 25 is provided with an inlet port 26 connected to duct 13 and the lower wall 27 with a lint outlet port 28 leading directly to the lint cotton cleaner 15.

Foraminous cylinder 30, which may be rapidly rotated by any desired means, is mounted in the casing with its axis normal to the direction of travel of lint from the inlet port to the outlet port and forms in effect a part of a partition dividing the casing into two compartments, the ports communicating with the left-hand compartment 31 viewed in Figure 3. The peripheral surface 32 of the cylinder is foraminous, being formed, for example, from polished perforated metal and the surface runs between the ports and, as shown, away from the inlet and toward the outlet, and closely adjacent the opposite wall 33, thus forming a narrow passageway between the surface and wall. Thus, as air and lint enter the compartment, a portion of air, but not the lint, passes through the foraminous peripheral surface.

Since the cylinder forms only a portion of the partition or compartment wall, a plate 35 forms the balance thereof between the cylinder and wall 25 and serves to direct the incoming air and lint past the cylinder, and a plate 36 forms the balance thereof between the cylinder and wall 27 and serves to direct the lint into the outlet port.

The compartment 40 on the right-hand side of the cylinder as viewed in Figure 3 is provided with an air-exhaust port 41 controlled by an adjustable gate valve 42 leading into main exhaust trunk 43. Adjustment of the valve serves to adjust the amount of air passing through the cylinder and consequently the amount fed onward through the outlet port.

The lint from which the major portion of air has been separated then feeds from outlet port 28 into the casing of lint cleaner 15 through an inlet port 45 directly onto the cleaning cylinder 50 which is provided with radially extending saw-tooth-shaped cleaning cylinder teeth which pick up the lint and whip it over spaced concave bars 51 previously with comb teeth 52. Foreign matter dislodged from the lint passes between the spaced bars and may be discharged into a chute 53.

Lint which clings to the cleaning cylinder teeth is doffed therefrom by an air jet 60 receiving air current from tube 61. The lint then passes through duct 16 and trunk 17 to the condenser as previously mentioned.

Aspirator port 63 is provided with a damper 65 to regulate the exit of air from the port.

The combined lint cotton cleaner and air-lint separator is simple to construct and to operate. Only two manual adjustments, that of the gate valve 42 and damper 65, are required and when properly set, the cleaner operates sufficiently with little attention regardless of variations in the amount of lint delivered from the gin.

We claim:

In a cotton-processing system wherein lint is conveyed through an air duct by air current, a lint cotton cleaner comprising a casing having an inlet port, a rotatable cleaning cylinder housed therein and provided with radially extending saw-tooth-shaped cleaning cylinder teeth, a concave housed in the casing and formed from spaced bars located adjacent the cleaning cylinder teeth, the lint being carried by the teeth into the concave, and means for receiving lint and air from the air duct, separating a portion of the air therefrom, and feeding the lint and remaining air through the inlet port directly into the cleaning cylinder teeth, an aspirator port being provided in the casing on the side of the inlet port remote from the region of entry of the lint into the concave, and a damper being provided for regulating the exit of air from the aspirator port thus to assist in directing the lint into the cleaning cylinder teeth.

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