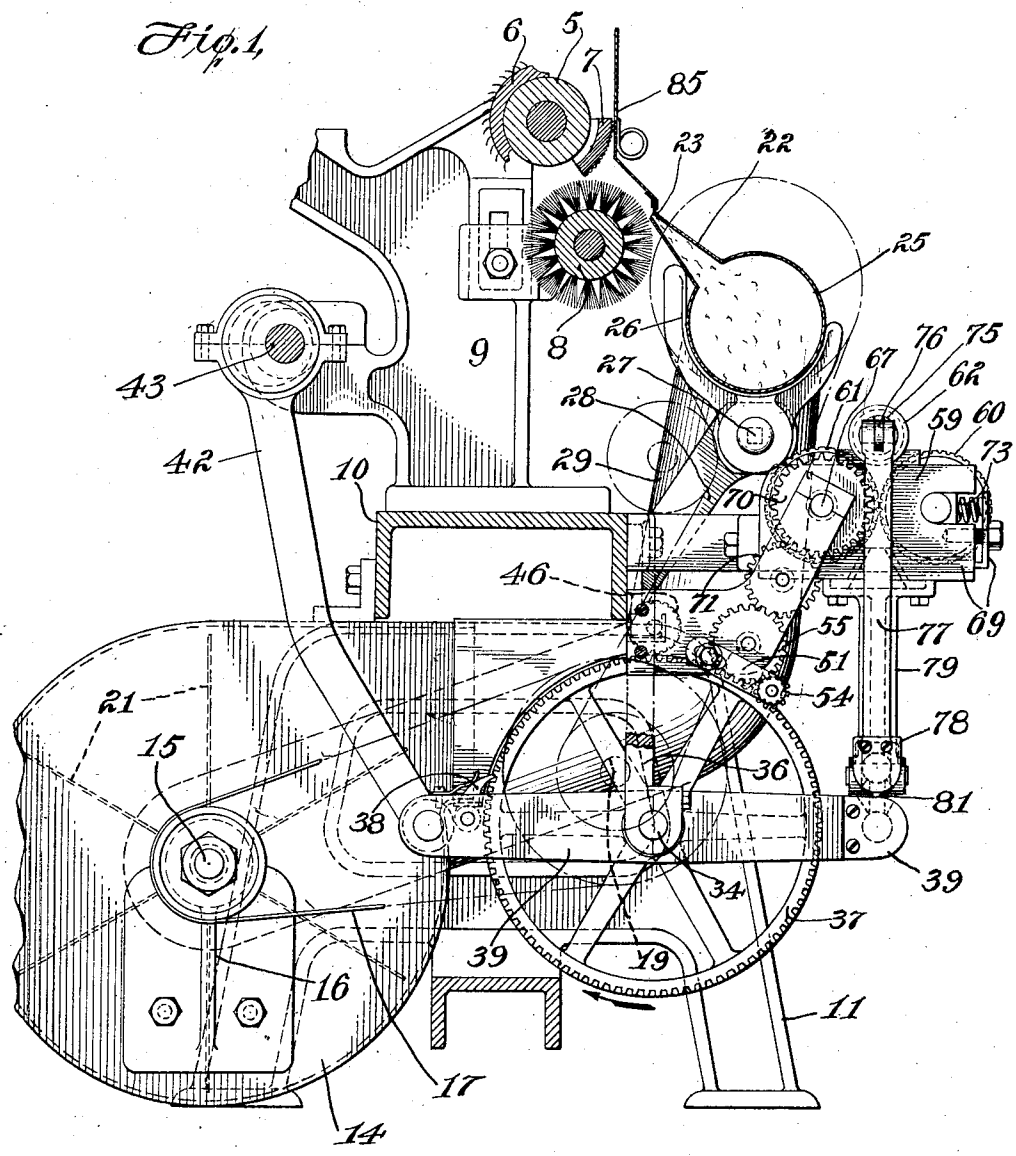
May 17, 1927. 1,629,092

F. L. CROCKETT

WASTE REMOVAL APPARATUS

Original Filed Sept. 10, 1918 2 Sheets-Sheet 1

Fig. 1.



Frank L. Crockett INVENTOR

BY

A. G. Kenyon

ATTORNEY

May 17, 1927. 1,629,092

F. L. CROCKETT

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Fig. 2.

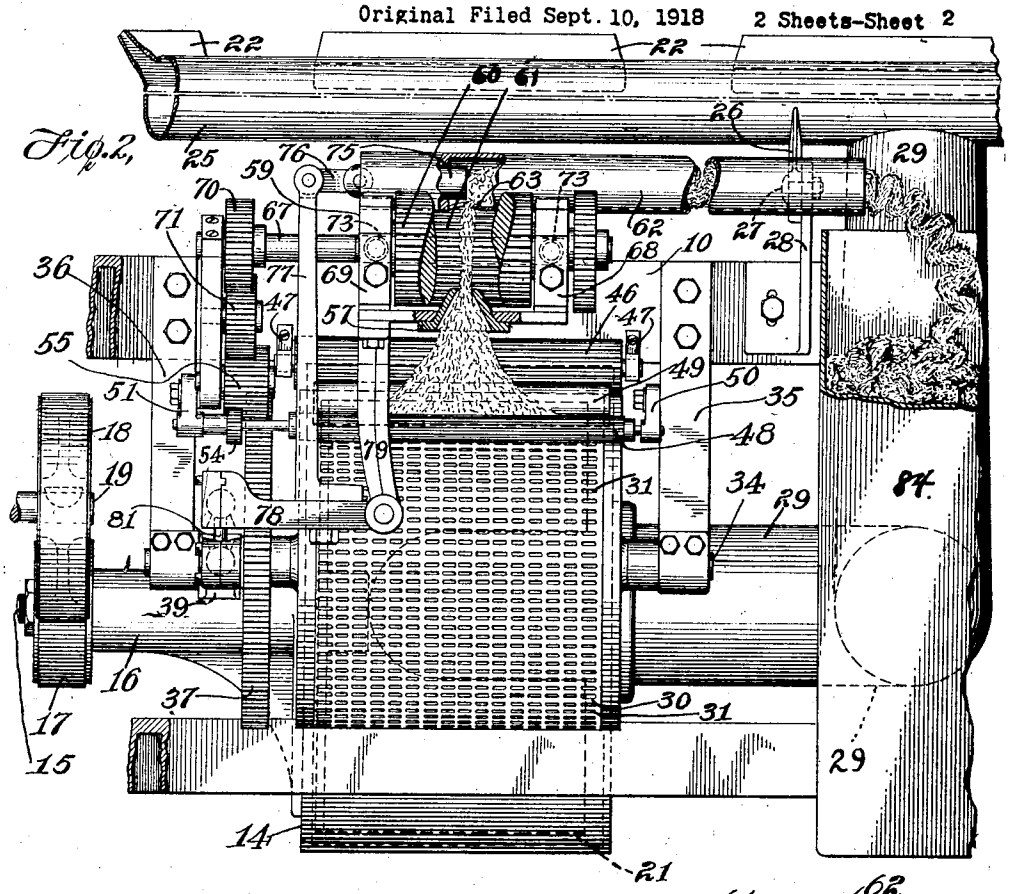
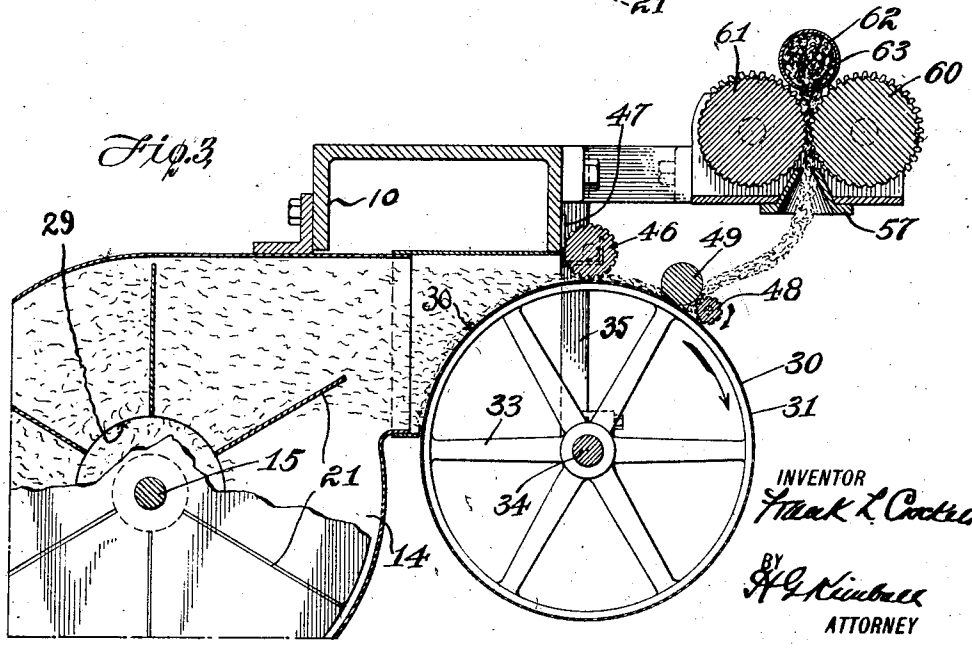


Fig. 3.



INVENTOR
Frank L. Crockett
BY
H. G. Kimball
ATTORNEY

Patented May 17, 1927. 1,629,092

UNITED STATES PATENT OFFICE.

FRANK L. CROCKETT, OF NORTH UXBRIDGE, MASSACHUSETTS, ASSIGNOR TO WHITIN MACHINE WORKS, OF WHITINSVILLE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

WASTE-REMOVAL APPARATUS.

Application filed September 10, 1918, Serial No. 253,350. Renewed December 1, 1925.

The invention is an improvement in cotton combers and other textile machinery, being concerned more particularly with the removal of waste, or combing noils for example, from the comb cleaning or scavenger brush of cotton combers and its discharge therefrom into waste boxes. The object is to improve this type of apparatus, using therefor a form of the common vacuum cleaner principle, and to discharge the waste in a more compact and more easily handled and also more marketable condition than has heretofore been possible in similar systems. A particular feature of the invention consists in the provision of an auxiliary condenser device of novel form and principle and by means of which the suction-removed waste is subjected to a final compacting as delivered to the waste can.

The several objects of the invention as above mentioned and such others as shall hereinafter appear, and the advantages of which will be apparent to those skilled in the art, are carried out in the combing machine hereinafter described and particularly pointed out in the appended claims.

In the drawings which illustrate the form at present preferred—

Fig. 1 is an end elevation of a portion of a combing machine showing the application thereto of the improved waste removing system;

Fig. 2 is an elevation thereof; and

Fig. 3 is a transverse section through the perforated screen drum and associated parts to illustrate the passage of the waste from the blower into the condensing tube.

The structure as herein described is adapted for application to common types of combing mechanism in which a rotary scavenger brush or similar element is used to remove the noils from the combing cylinder. The combing machine shown in the drawings is of the well known Heilmann multiple head type, usually comprising eight heads. The mode of operation of this comber is familiar to those skilled in the art so that only such parts are represented as are necessary to illustrate the cooperation of the invention therewith. Such parts comprise the combing cylinder 5 having a combing segment 6 and a detaching segment 7, and the rotary scavenger brush 8. The cylinders and brush are mounted on shafts journalled in uprights 9 rising from the main table girder 10 of the machine, which latter is supported on a series of standards 11. The comb cylinder and the brush rotate at different rates so that as the brush engages the comb 6 it removes the waste adhering thereto.

The waste removing and condensing devices comprise an exhaust-creating means or blower 14 which is conveniently situated on the floor below the girder 10. The blower shaft 15 is journalled in the single elongated bearing 16 on one side of the blower casing as indicated in Fig. 2 and is driven by a belt 17 from pulley 18 mounted on a constantly turning shaft 19. The fan blades 21 (see dotted lines of Fig. 2) are supported on the blower shaft adjacent the journal 16 and with their free ends adjacent the entrance 29 to the casing, so that the waste-laden air current is thus relatively remote from any shaft-bearing. The vacuum effect created by the fan is communicated through the pipes 29 and 25 to a series of elongated nozzles 22, one for each combing head. The narrow open end or mouth 23 of each nozzle is placed close to the periphery of the brush 8 and is substantially the width of the brush and all the nozzles as shown in Figs. 1 and 2 are mounted on the longitudinally disposed suction pipe 25 extending the length of the machine and supported by curved bracket arms 26 adjustably secured by means of bolts 27 to brackets 28 (Fig. 2) on the table girder 10. The said suction pipe 25 is connected at any point between the (closed) ends to the trunk 29 which leads to the suction side of the fan. The waste thus sucked off the scavenger brushes is driven by the force of the air current against the surface of a perforated drum or screen 30 located across the discharge outlet of the blower. To this point the waste has been carried in suspension in the air current but on the escape of the air through the cylindrical wall of the screen drum it becomes matted thereon, the perforations being small enough to prevent the passage of the waste. The screen drum is supported at each end upon open frames or spiders 33 and carried on a drum shaft 34 journalled in bearings in the lower ends of hangers 35 and 36 depending from the main table girder. The air escapes from the interior through the open ends and is free from cotton fibres. The drum is rotated to present

a continually fresh surface to the blower outlet and permit the matted fibres to be removed, for which purpose the drum shaft carries a large spur gear 37 driven by means of a pawl 38 pivoted upon an oscillating lever 39 fulcrumed on shaft 34 and driven by an eccentric rod 42 connected to a comber cam shaft 43. The junction of the blower outlet with the screen drum is sealed in part by a heavy fluted roller 46 loosely resting in bearings 47 on the main table girder. This roll 46 also acts to press the waste against the drum as it passes out of the air flow thus producing a lap or fleece in a partially condensed form and said lap or fleece of noils is stripped from the drum by a pair of delivery rolls 48 and 49 located just beyond the compressing roll 46. The fluted roll 48 is supported at one end in a bearing 50 secured to the hanger 35, and at its other end in a bearing 51 secured to the hanger 36, both bearings being adjustable toward the drum as indicated. The pinion 54 at one end of this roll is driven by a gear 55 in mesh with the large gear 37 being thus driven in an opposite direction to the screen drum and closely adjacent to the periphery of the latter so that it strips the lap of compressed waste from the latter as indicated in Fig. 3. The smooth stripping roll 49 rests on the drum and upon the other stripping roll 48 cooperating therewith in an obvious manner to turn the lap upwardly or away from the drum. From these stripping rolls which also have a compacting effect the lap is conducted into an inverted condensing trumpet 57 through which it is drawn by a pair of fluted rolls 60 and 61, one or both of which is driven from the drive gear 37 through a shaft 67 and the gear train 70, 71 and 55. The said rolls are shown as intergeared so that they rotate in unison and they are also pressed toward each other by the spring or springs 73 which are adjustable as indicated in Fig. 1. The sliver drawn through the trumpet is delivered upwardly and through a lateral opening into the condensing tube 62 wherein it is subjected to further condensation by the action of a plunger 75 reciprocating in the left hand end of said tube. The outer end of the plunger is connected by a link 76 with the upper end of an arm 77 rising from a lever 78 pivoted on the lower end of a bracket 79 secured to the under side of roll support. The outer free end of the lever 78 is articulated with the rear end of the lever 39 by means of a link 81 in ball and socket connection with both the lever 39 and the lever 78. The above described construction is such that as the lever 39 is oscillated by the eccentric rod 42 the lever 78 and arm 77 are also oscillated, thereby imparting a reciprocatory motion to the plunger 75. This action of the plunger on the sliver in the condensing tube pushes it through the latter and in so doing serves to fold it upon itself in convolutions, as indicated in Fig. 2, and by reason of the fact that the noil sliver is inherently unable readily to transmit the pressure imposed on it by the plunger, it remains in the condensing tube until it reaches a further degree of compactness, in which condition it remains for a period of time corresponding to the length of the tube. As a result, when the condensed round sliver is finally discharged from the open end of the condensing tube into the can 84, it has been condensed by compression and is in excellent condition for application to the uses to which it is subsequently put.

The waste removing and condensing devices described above have many features of advantage other than those enumerated. The relatively small and narrow mouths or openings of the nozzles permit the formation of a vacuum of considerable rarefaction in the pipe 25 by the expenditure of but little energy which not only assures a thorough cleansing of the brushes, but reduces considerably the cost of operation, as compared with those brush cleaning devices in which the combing cylinder and brush are enclosed in a hood forming part of the vacuum system. Moreover such nozzle arrangement prevents accumulation of fly and dust upon the comb shaft journal and adjacent parts, thus tending to insure a clean combed sliver, and it also permits ready access to the combing heads from the rear of the comb cylinders which are shielded by an imperforate removable apron 85 attached to the nozzles and provided with a handle as indicated. The auxiliary compacting apparatus of itself possesses definite advantages, receiving, as it does, a round silver already partly condensed by the rolls 60 and 61 and further condensing the same by the application of pressure which is sustained (within the tube) for some considerable time, so that the fibre as ultimately delivered is very thoroughly condensed although in a condition to be readily fed to waste-working machinery. The principle embodied in the condensing tube apparatus as herein described is susceptible of application in different ways and in different machines and although it is herein shown in connection with a cotton comber, its use is not so limited, nor does its action depend upon the character of the instrument, plunger or otherwise, which by compression produces the advance of the cotton through the tube. It will be apparent as the result of such condensing action that the discharged waste occupies but little space. A single waste can of moderate size can thus be made to serve an ordinary comber without requiring to be frequently emptied.

Claims.

1. A machine of the kind described com-

prising exhaust-creating means for removing waste from an element of the machine, a condensing tube and means comprising a mechanical element for feeding waste into said tube and moving the same by compression through the same.

2. A machine of the kind described comprising exhaust-creating means for removing waste therefrom including a condensing tube, a plunger therein and means for introducing the waste into said tube.

3. A machine of the kind described comprising means for removing waste therefrom and means for converting same into rounded sliver form, a condenser tube into which such sliver is introduced and means for pushing the sliver through the tube.

4. As a condensing means for fibrous materials, means for converting the material into sliver form, a condensing tube and a mechanical element for pushing the sliver through said tube whereby it is condensed by compression therein.

5. In a machine of the kind described, suction means for removing waste from an element of the machine, a condensing tube having a plunger for acting on the waste, and means for feeding the waste into the condensing tube.

6. The combination in a multiple head combing machine, of a series of narrow elongated nozzles, one placed close to the periphery of each scavenging brush, a suction producing device, passageways connecting all said nozzles to the said suction producing device, and a screen means, common to all said nozzles, intercepting the fibres in the air current.

7. The combination in a multiple head combing machine, of a series of narrow elongated nozzles, one placed close to the periphery of each scavenging brush, a suction producing device, pipes connecting all said nozzles to the inlet of the suction producing device, a screen means intercepting the fibres in the air current, and a pipe connecting said screen means to the outlet of the suction device.

8. The combination in a multiple head combing machine, of a series of narrow elongated nozzles, one placed close to the periphery of each scavenging brush, a suction producing device, pipes connecting all said nozzles to the inlet of the suction producing device, a rotary perforated drum, a pipe connecting the drum to the outlet of the suction device, means to mat the fibres on the drum, and means for removing the matted fibres from the drum.

In testimony whereof, I have signed this specification.

FRANK L. CROCKETT.