W. H. GOLDSMITH, JR.

PNEUMATIC CARD CLEANING APPARATUS.

APPLICATION FILED JUNE 19, 1918.

1,338,651.

Patented Apr. 27, 1920.

2 SHEETS—SHEET 1.

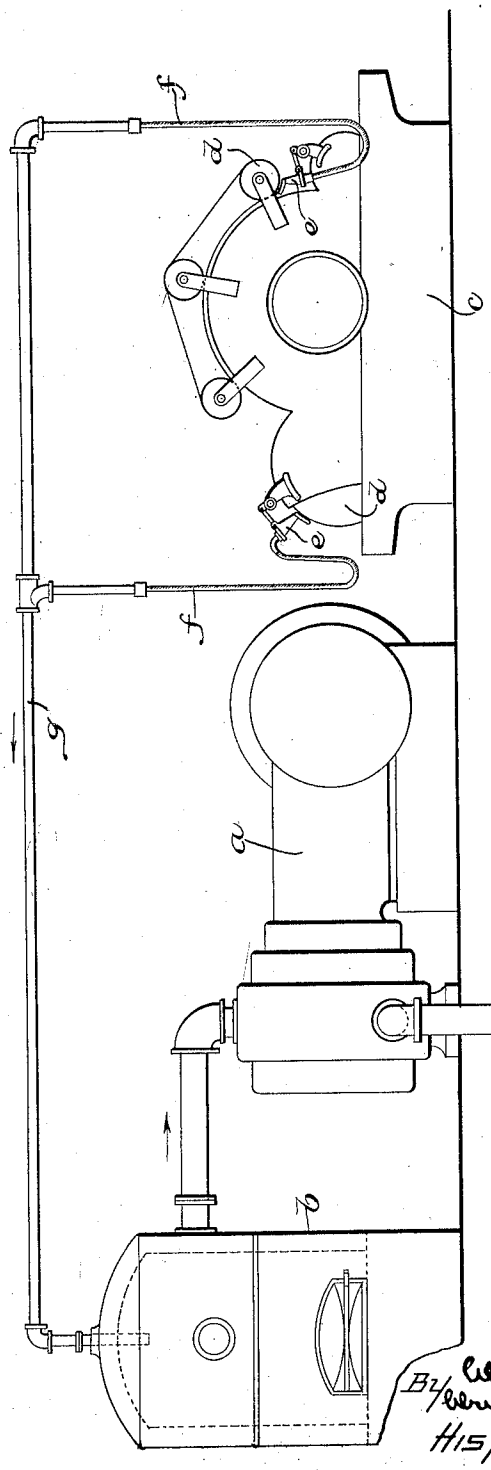


Fig. 1.

INVENTOR=

BY Charles H. Goldsmith Jr.
Longfellow Moore Dewey & Clay

HIS ATTORNEYS=

W. H. GOLDSMITH, JR.

PNEUMATIC CARD CLEANING APPARATUS.

APPLICATION FILED JUNE 19, 1918.

1,338,651. Patented Apr. 27, 1920.

2 SHEETS—SHEET 2.

Fig. 2.

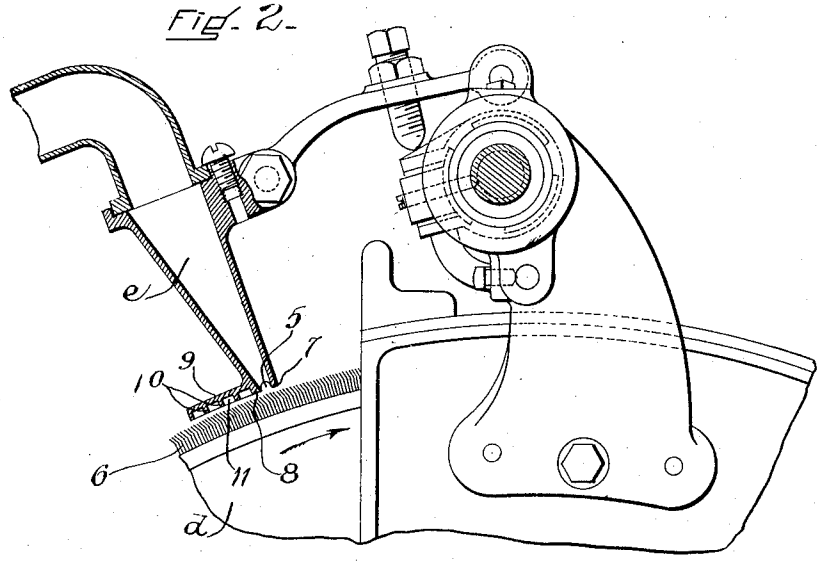


Fig. 3.

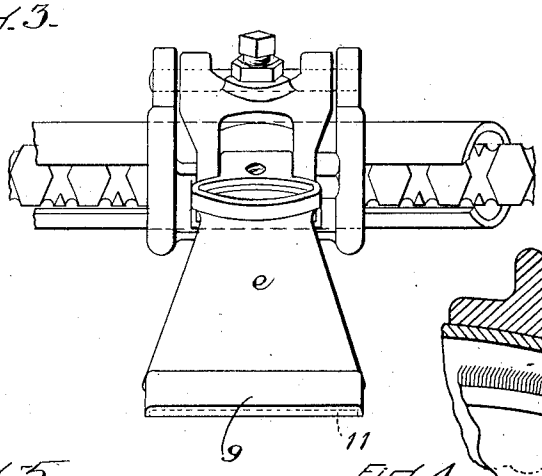


Fig. 4.

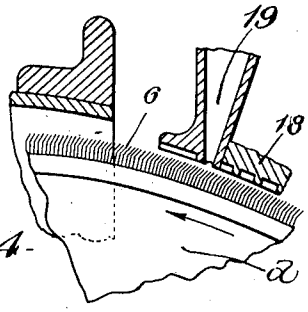
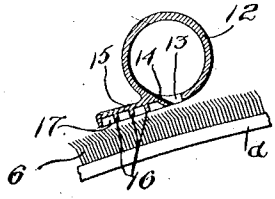


Fig. 5.



INVENTOR=

William H. Goldsmith Jr.

By Albright Brown Dunlop & Ely

HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM H. GOLDSMITH, JR., OF QUINCY, MASSACHUSETTS.

PNEUMATIC CARD-CLEANING APPARATUS.

1,338,651. Specification of Letters Patent. Patented Apr. 27, 1920.

Application filed June 19, 1918. Serial No. 240,882.

To all whom it may concern:

Be it known that I, WILLIAM H. GOLDSMITH, Jr., citizen of the United States, residing at Quincy, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Pneumatic Card-Cleaning Apparatus, of which the following is a specification.

This invention has relation to pneumatic card-stripping or card-cleaning apparatus, that is, an apparatus which is employed for stripping from card clothing the fibers which are caught or packed in the wires constituting the card clothing.

Such an apparatus ordinarily comprises a powerful vacuum pump, a vacuum chamber, a receiver for the fibers, and a nozzle connected by a conduit with the vacuum chamber and having a mouth or opening which is brought close to the surface of the card clothing, but preferably not in contact therewith, to suck or draw the fibers therefrom. These instrumentalities thus generalized as well known, and, broadly stated, constitute no part of my invention save that they or their equivalents are necessary to the practical operation of an appliance embodying the invention.

The wires constituting the clothing of a carding cylinder or doffer, or other operating element of a carding machine, are all angular, that is, while their inner ends are approximately radial in respect to a common axis or center, their outer ends are bent and are tangential to an imaginary cylinder formed about said center, and, as a result, it is difficult with the nozzles as heretofore constructed to insure the removal of the fibers which become entangled in the wires, especially as the ends of the wires become more or less burred after considerable use. When an ordinary nozzle is used, especially in relation to a rotating carding element, the greater portion of the air is sucked into the nozzle in a path across the bent ends of the wires, this being induced to some extent by the rotation of said element which draws a current of air around with it. Hence, instead of removing all of the fiber from the clothing, a fairly large proportion of it remains entangled in the wire.

I have discovered that what is needed, in order, with the most economical use of paper, to strip the clothing clean, is to apply the pull of the indraft (obtainable from a given amount of power through a given nozzle or opening) to air derived from points on the outer side of the knee angle of the wires and thence drawn between and up the wires in a path becoming longitudinal approximately of the outer ends of the wires, and that this can be accomplished practically by my discovery, and my invention or discovery comprises a means for checking the rush of air coming from the inner side of this knee angle past the side of the nozzle or opening, and thereby increasing the dependency of the intake for its air supply upon air coming from the opposite or outer knee angle side of the wires, this being further assisted by having the nozzle take approximately a line of elongation to the same ends of the wires at the time and point of application.

Any suitable means which will accomplish the result may be employed, such as a lip located at one wall of the nozzle, although so far I have secured the best results by forming the lip with baffles to provide air chambers for breaking up the current of air and retarding its passage under the lip. When the rotating member travels in the direction of the bent extremities of the wires, the lip or other obstructing member should be at the forward wall of the nozzle or opening; and, when the rotating member travels in the opposite direction, this lip or obstructing member should be at the rearward wall of the nozzle or opening.

Referring to the accompanying drawings,—

Figure 1 illustrates more or less diagrammatically and conventionally a carding machine, a pump and a vacuum chamber and lint receiver, with conduits leading to nozzles constructed in accordance with my invention.

Fig. 2 shows a traversing nozzle which embodies the invention.

Fig. 3 shows a rear view of the same.

Fig. 4 illustrates in section another form of traversing nozzle, in which the lip or baffle is formed separately therefrom and is stationary.

Fig. 5 illustrates in section another form of nozzle.

The vacuum pump is indicated as a whole at *a*, the casing containing the vacuum chamber and lint receiver at *b*, and the carding machine at *c*. Said machine has two rotary elements at *d d* from which the fiber

may be stripped by the nozzles *e e*, which are connected by flexible pipes *f f*, connected to the main *g* leading to the vacuum chamber.

The particular mechanism, by which the nozzles may be fed back and forth to traverse the card element, or are wholly or partially opened or shut, is immaterial to the present invention and need not be described, particularly as a stationary nozzle of appropriate constant size, or with sectional or other shut-offs, to effect the operating size, such as commonly used, may be employed in the embodiment of the invention. I shall, therefore, describe only the retarding element and its relation to the nozzle or opening therein. The element which I herein term the "nozzle" may be of any suitable shape so long as it is provided with a relatively small (preferably elongated) operating opening or mouth 5, such as afforded by the parallel walls 7, 8, and may be brought close to the ends of the wires of the card clothing, as indicated at 6 in Fig. 2. The element *d*, on which the wires are secured, rotates in the last-mentioned figure in the direction of the arrow, but may rotate in the opposite direction, and the ends of the wires are inclined rearwardly in respect of the direction of peripheral movement of said element and of the travel of said wires, as indicated in Fig. 4. At the rear wall 8 of the mouth 5 is provided a rearwardly extending retarding member which in Fig. 2 is a lip integral with or attached to the nozzle, but which also may be separately provided by means suitable to afford contact approximately with this wall of the nozzle. In Fig. 4, the lip or retarding member, which is stationary, is indicated at 18, and the traversing nozzle 19 is in contact therewith but is movable relatively thereto. If the carding member rotates in the opposite direction with reference to the angle of the wires, the retarding member should be on the reverse side of the nozzle to the one shown in either Figs. 2 or 4. This retarding member, in any case, lies close to the ends of the wires, but preferably not in contact therewith. Said retarding member is extended sufficiently from the wall of the nozzle to cut off wholly, or to a large extent, the flow of air between the edge of the wall 7 and the periphery of the carding element. I have found six times the width of the opening to be the desirable width of the said member but do not limit myself thereto. This lip may be flat, but I find that I secure even better results by providing the lower face of the lip with a plurality of baffles or ribs 10, to form what I term "eddy chambers" 11, to break up or interfere with the flow of air underneath the lip. By this construction, the main current of air, which is drawn into the nozzle *e* through the opening, passes underneath one wall 6 and it is caused to flow in a direction approximately longitudinally of the bent ends of the wires. As each individual wire moves from registration with the rear wall 8 of the mouth to the front wall 7, such fiber as may be carried thereby or entangled therewith is subject to an increasing current of air and is effectively stripped and cleaned, as will be clearly understood.

As previously stated, it is not essential that a traversing nozzle as at *e* should be utilized, as I may employ a tubular nozzle extending clear across the element as indicated in Fig. 5, with appropriate sectional or other shutoffs to reduce the volume at the point and time of application. In this case, the tubular nozzle is indicated at 12 and it is provided with a mouth 13 extending throughout its length. The wall 14 has the lip 15 provided with the ribs or baffles 16 which form the eddy chambers 17.

It will be understood that I do not limit myself to any particular form of lip, and that by the term itself I mean to include any element, either attached to or separate from the nozzle or walls to the opening, by which the flow of air, under the indicated wall of the mouth or opening, is prevented, retarded or interrupted.

Having thus explained the nature of my said invention, and explained a way of constructing and using an embodiment thereof, what I claim is:

1. The combination, with a carding element and an air-drawing stripping nozzle, of means for retarding or preventing the flow of air past one of the sides of said nozzle into the opening thereof.

2. The combination, with a rotating carding element and an air-drawing stripping nozzle, of a retarding member extending away from the wall of the nozzle in the direction toward which the outer part of the wires of the card clothing incline, and adjacent the end of the wires of the carding element, and arranged to retard or interrupt the flow of air into said nozzle or opening, under the said wall thereof.

3. The combination with a carding element having the wires thereof formed with bent ends, a stripping nozzle having an elongated opening adapted to be located at the ends of said wires, and means for causing an indraft of air into said mouth, of a retarding member, projecting from the wall of said opening in the same general direction as the bent ends of the wires adjacent said nozzle, for retarding or interrupting the free flow of air thereunder into said opening, whereby the main indraft of air into the nozzle is under the opposite wall of said opening and is generally longitudinal of said bent ends of the wires.

4. The combination, with a rotating carding element and an air drawing stripping nozzle, or opening, stationary or traveling in a different direction or at a lower rate of speed, of a retarding member adjacent to the wall of the nozzle or opening, but not necessarily attached thereto, and extending away from the nozzle or opening in the direction toward which the outer part of the wires of the card clothing incline, and adjacent, but preferably not contiguous, to the ends of the wires of the carding element, and attached to the frame of the carding element, or in any other convenient manner, and equipped on the surface adjacent to the carding element with one or a series of baffles, projections or grooves, and arranged to retard or interrupt the flow of air into said nozzle or opening, under the indicated wall thereof.

5. A vacuum card cleaning apparatus comprising the combination with a traveling carding element having bent wires, of a suction nozzle arranged with its inlet opening adjacent to the extremities of said wires, that boundary of the opening at the side away from which the wires incline being unobstructed to permit free passage of air, and an air obstructing member extending from the opposite boundary of said opening approximately parallel to the carding element.

6. The combination with a traveling carding element having inclined wires, of a suction nozzle arranged with its inlet opening adjacent to the extremities of said wires and an obstructing member extending from one side of said opening near to the extremities of said wires and approximately parallel to the path in which they travel and in the direction toward which the wires are inclined, said obstructing member having baffles and intermediate eddy chambers entirely crossing the approach from that side to the nozzle, and the opposite side of the nozzle being unobstructed.

In testimony whereof I have affixed my signature.

WILLIAM H. GOLDSMITH, JR.