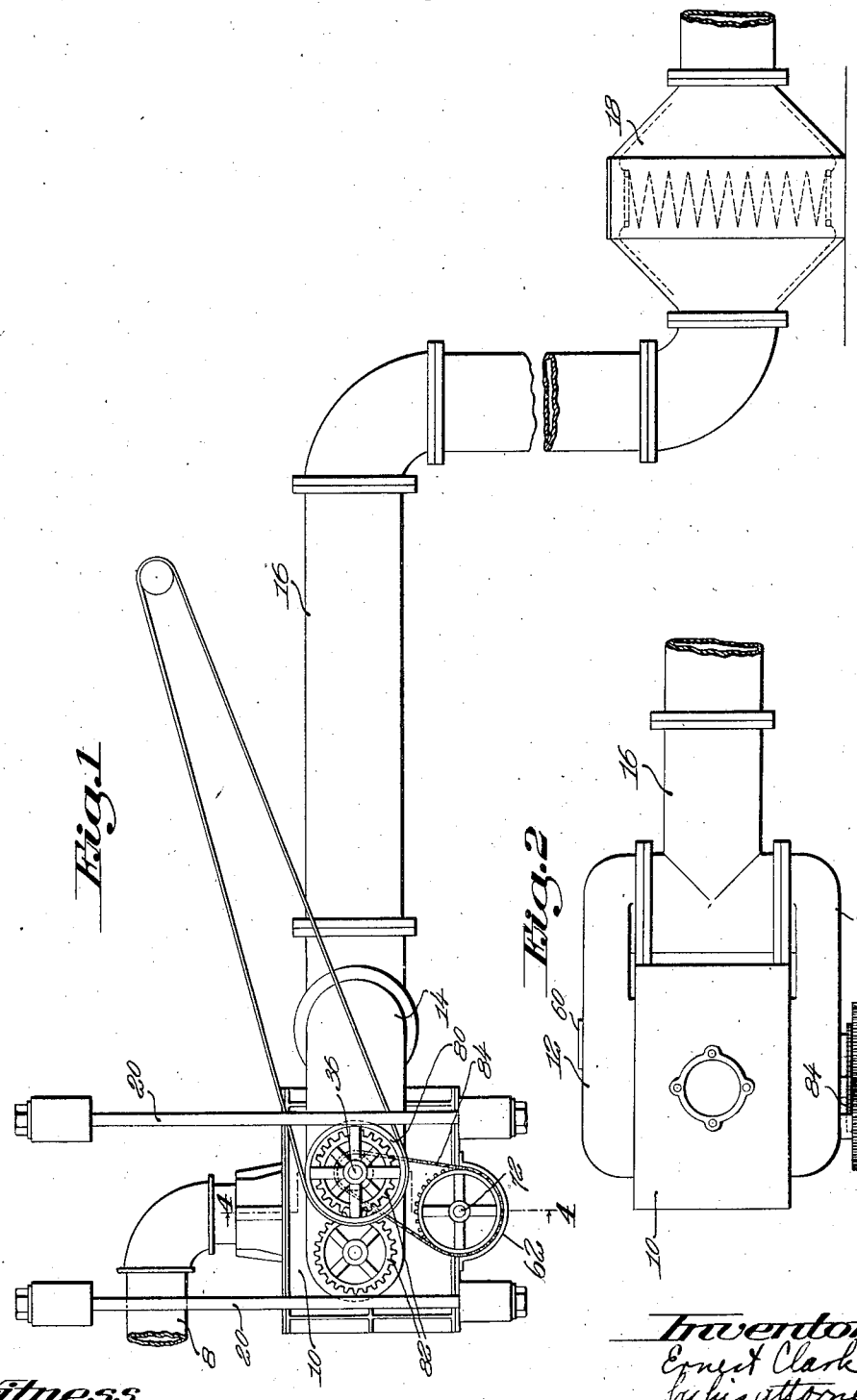
Aug. 1, 1944. E. CLARK 2,354,796

DEPOSITING APPARATUS

Filed April 9, 1943 3 Sheets-Sheet 1



Witness
Frederick S. Grundy

Inventor
Ernest Clark
by his attorney
Melvin R. Kenney

Aug. 1, 1944. E. CLARK 2,354,796

DEPOSITING APPARATUS

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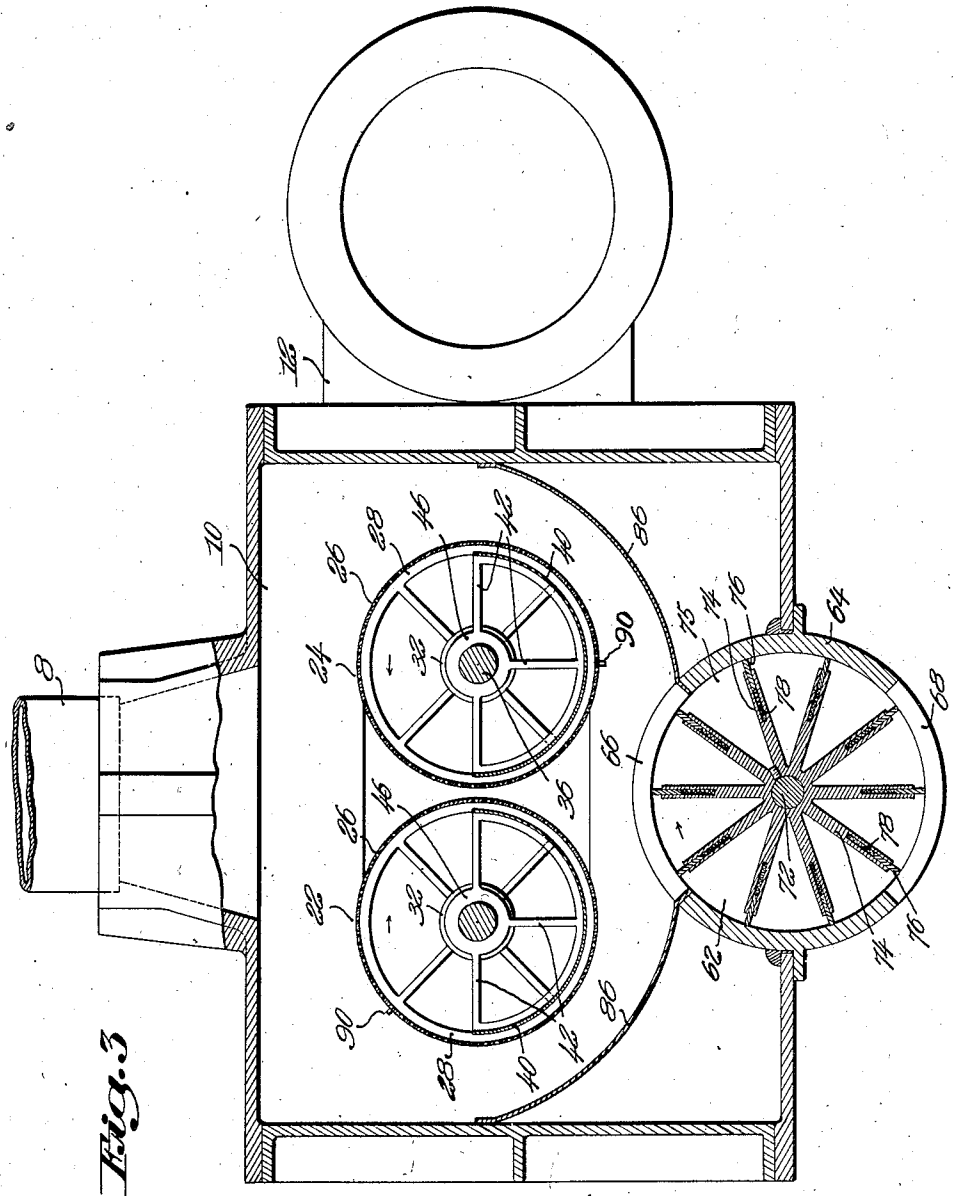


Fig. 3

Witness
Frederick S. Grunsfeld

Inventor
Ernest Clark
by his attorney
Melvin K. Jennings

Aug. 1, 1944. E. CLARK 2,354,796

DEPOSITING APPARATUS

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Fig. 5

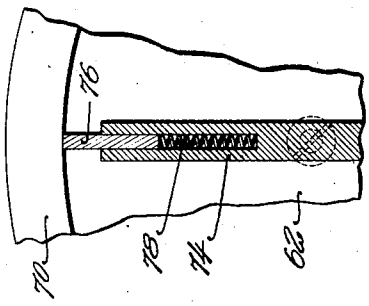


Fig. 6

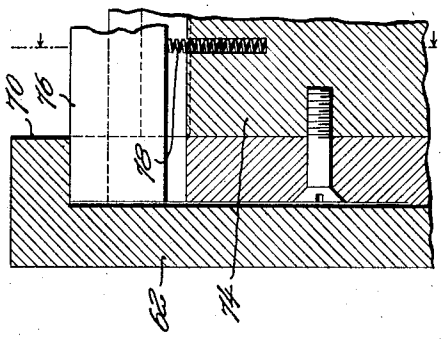
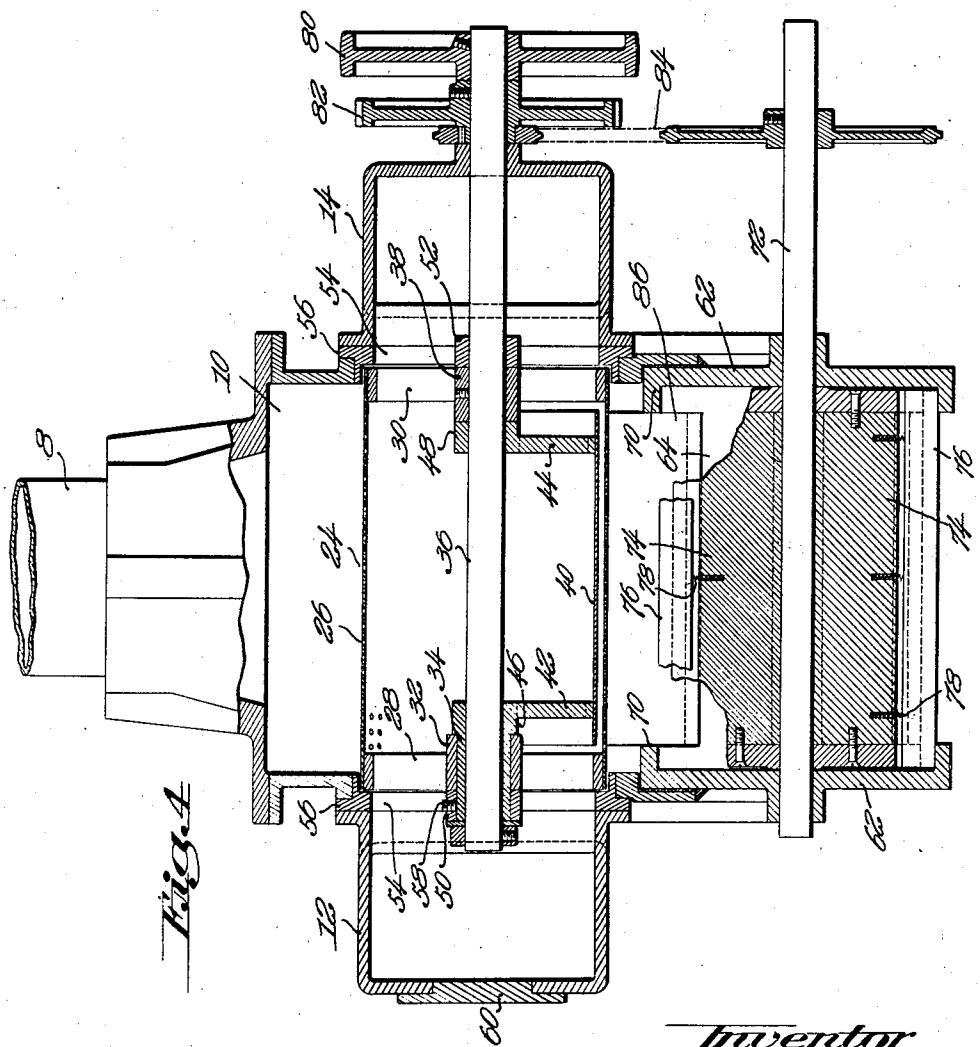


Fig. 4



Witness
Frederick S. Grundeen

Inventor
Ernest Clark
by his attorney
Melvin K. Fawley

Patented Aug. 1, 1944 2,354,796

UNITED STATES PATENT OFFICE

2,354,796

DEPOSITING APPARATUS

Ernest Clark, Brockton, Mass., assignor to Abington Textile Machinery Works, Boston, Mass., a trust of Massachusetts

Application April 9, 1943, Serial No. 482,392

3 Claims. (Cl. 19—75)

The present invention relates to depositing apparatus, and more particularly apparatus for depositing strippings of cotton or other fibers pneumatically stripped from the cylinders of a carding machine.

The air-borne fibers removed by the pneumatic stripping apparatus have considerable value if they are separated from the air in a manner to make them available for reuse. Separators operating on the centrifugal or cyclone principle are unsatisfactory, because they twist and mat the fibers into a form unsuitable for reuse. Any device depending on the use of mechanical scrapers or agitators has been found undesirable for the same reason.

It is the object of the present invention to provide simple and effective means for depositing the fibers from the air current in a manner to maintain the fibers in loose, unmatted, usable condition.

With this and other objects in view, the invention comprises movable condensers, preferably in the form of cylinders, through which the air passes and on which the fibers are deposited in a loose condition. The fibers are carried by the condensers to a point of discharge where they may be compressed by the joint action of the condensers. Thereafter the fibers are discharged through a lock, preferably of rotary form, into the atmosphere. Certain features of construction hereinafter to be described in detail also constitute features of the invention.

In the accompanying drawings, Fig. 1 is an elevation of a depositing system, embodying the features of the present invention; Fig. 2 is a plan view of a portion of the system including the separating chamber; Fig. 3 is a sectional end elevation of the separating chamber; Fig. 4 is a sectional elevation of the chamber on line 4—4 of Fig. 1; and Figs. 5 and 6 are detail views of the vanes.

The system shown in Fig. 1 comprises a duct 8 leading from pneumatic stripping apparatus of carding machines to a chamber 10 to be described later in detail. Outlet casings 12 and 14 connect with the ends of the chamber 10 and are themselves connected together and with an outlet duct 16 leading through a suitable filter to the suction apparatus. In operation, the air-borne fibers resulting from the stripping operation are passed through the duct 8 into the chamber 10, wherein the fibers are separated from the air. The air continues through the outlet duct 16 and filter 18. As shown in Fig. 1, the separator may be conveniently suspended from the ceiling by supports 20.

As shown in Figs. 2 and 3, the separating chamber includes two rotary condensers 22 and 24, each comprising a perforated sheet metal cylinder 26 mounted at its ends on spiders 28 and 30. The perforations in the cylinder 26 may be ¼" holes spaced approximately ½" apart.

As shown in Fig. 4, the spider 28 is provided with a hub 32 mounted to rotate on a bushing 34, through which passes the condenser drive shaft 36. The spider 30 has a hub 38 secured to the shaft 36 by a set screw or other suitable means.

Within each condenser is a baffle 40 of substantially semi-cylindrical form mounted on spiders 42 and 44. The spider 42 is provided with a hub 46 integral with the bushing 34, and the spider 44 has a hub 48 adjacent the hub 38 of the condenser. The assembly is journaled in bearings 50 and 52 which are supported by spokes 54 secured to flanged mounting rings 56 secured between the casing of the separator chamber and the outlet casings 12 and 14. The bearing 50 receives one end of the bushing 34 and is secured thereto in adjusted position by a set screw 58. This construction allows the baffle 40 to be maintained in any desired fixed position while the condenser is continuously rotated by the shaft 36. Each baffle should be as close as possible to the internal condenser surface, although a considerable spacing is indicated in Fig. 3 to avoid confusion in the drawings.

The condensers 22 and 24 are similar in construction and are provided with similar baffles. As shown in Fig. 3, the condensers rotate in opposite directions and are separated by a small gap. The baffles are preferably adjusted to the position shown in Fig. 3, so that they baffle the lower half of each condenser cylinder, although a slightly different setting of the baffles is sometimes desirable, as will hereinafter be explained.

The ends of the condensers communicate with the exhaust casings 12 and 14. Therefore, the fibers are deposited on the perforated cylinders while the air enters the cylinders and passes lengthwise thereof into the exhaust casings. The exhaust casing 12 is provided with a manhole and cover 60 to afford access to the baffle-adjusting means.

Below the condensers, the casing is provided with a rotating depositor, serving as an air lock. The depositor comprises end members 62 connected by walls 64 of incomplete cylindrical form, whereby openings 66 and 68 are left at the top and bottom of the device. The end members are provided with flanges 70 extending inwardly into the openings 66 and 68. A shaft 72 is suitably journalled in the end member 62.

The shaft carries a rotating assembly comprising a series of radial vanes 74, forming a series of sectorial pockets 75. Each vane is provided with a blade 76 pressed by a compression spring 78 into engagement with the cylindrical walls 64 or the flanges 70 of the depositor. The vane assembly may be rotated in either direction, indicated as clockwise in Fig. 3.

The parts are driven by a suitable belt connection to a pulley 80 on the shaft 36 of one of the condensers, and the other condenser is driven therefrom by spur gearing 82. The shaft 72 is driven from the shaft 36 by a sprocket chain connection indicated at 84.

As shown in Fig. 3, two metal guides 86 are attached to the cylindrical walls 64 of the depositor and extend outwardly to the side walls of the separating chamber. These guides incline downwardly from the chamber walls towards the opening 66, and thus serve to direct fibers into the rotary depositor.

In operation, the current of air-borne fibers enters the separating chamber from the top and the fibers drop on the rotating condensers while the air continues through the condensers into the exhaust ducts. As the condensers rotate, the deposited fibers are retained by the suction on their outer surfaces until the fibers reach the point where the suction is cut off by the baffles. This is approximately at the bite of the rotating wheels, as indicated in Fig. 3, so that the fibers are released in a somewhat condensed or compressed form. The fibers then drop into the pockets 75 of the depositor. As the depositor rotates, the fibers are carried to the open bottom 68, from which they are discharged into any suitable receptacle.

The guides 86 serve to direct into the depositor any fibers that do not enter immediately through the open top 66. These guides also prevent the accumulation of fibers in the corners of the separator chamber. It has been found that there is a tendency for some fibers to accumulate on one of the guides, usually the left hand guide as viewed in Fig. 3, when the depositor vanes are rotated in a clockwise direction. The reason for this accumulation is believed to be that as one of the pockets turns into communication with the chamber 10, the air in the pocket, which is at atmospheric pressure, puffs into the chamber, which is at a lower pressure. This puff of air carries some fibers along with it, and since, with this direction of rotation, the puff occurs at the left hand side, it carries some of the fibers up on the left hand guide. The accumulation of fibers on the guide is of no consequence unless the fibers build up to such an extent that they mat against the rotating condenser. To prevent this, the left hand condenser is provided with a row of pins 90 protruding a short distance from the cylinder. The pins must be sufficiently short to prevent engagement with the other condenser, but it has been found that pins need be no longer than about $\frac{1}{2}$''. These have been found adequate to prevent excessive accumulation or matting of fibers between the guide and the condenser. The pins appear to clear the guide by simply breaking up the accumulation of fibers, whereby the fibers then slide into the depositor, although some of the fibers may be carried around the condenser by the pins.

In order to permit the apparatus to be set up for rotation of the vanes in either direction, a set of pins 90 may be provided for the right hand condenser, and arranged in such a position that they do not strike the pins of the other set. If the vanes are rotated counter-clockwise, the pins on the right hand condenser will serve to clear the right hand guide 86.

The adjustment of the baffles has been mentioned. In cases where the air flow is excessive it is advisable to set the baffles with their inner edges slightly above the horizontal. The baffles do not form a perfect seal against air flow; hence with excessive air flow, the fibers may be retained on the condensers longer than is necessary to permit them to fall into the depositor. In any case the fibers released from the condensers will drop on the guides 86 if they do not fall directly into the depositor, and will eventually reach the depositor as above described, but it has been found advantageous to adjust the baffles to accord with the existing flow conditions, in order to reduce any tendency of the fibers to accumulate on the guides.

It will be observed that the fibers are deposited on the perforated condensers in a flocculent condition and without any swirling or agitation which would be likely to produce twisting or matting of the fibers. The fibers are, in some instances, of considerable length and they tend to twist together under any conditions of turbulence or agitation. These fibers are valuable for reuse only if they are obtained in loose, untwisted condition. After passing from the condensers the fibers simply drop into the air lock, or on the guides from which they slide into the lock without any further agitation.

Having thus described my invention, I claim:

1. Apparatus for separating textile fibers from an air current comprising a separating chamber, two rotary condensers in the chamber each having a perforated cylindrical wall through which the air passes and on which the fibers are deposited, internal stationary baffles for the condensers to release the fibers, curved guides below the condensers, clearing means carried by one of the condensers to prevent accumulation of fibers on the adjacent guide, and air lock means into which the fibers are discharged from the guides to convey the fibers from the chamber to a region of different pressure.

2. Apparatus for separating textile fibers from an air current comprising a separating chamtwo rotary condensers in the chamber each having a perforated cylindrical wall through which the air passes and on which the fibers are deposited, internal stationary baffles for the condensers to release the fibers, curved guides below the condensers, rotating clearing means to prevent accumulation of fibers on either of the guides, and air lock means into which the fibers are discharged from the guides to convey the fibers from the chamber to a region of different pressure.

3. Apparatus for separating textile fibers from an air current comprising a separating chamber, two rotary condensers in the chamber each having a perforated cylindrical wall through which the air passes and on which the fibers are deposited, internal stationary baffles for the condensers to release the fibers, curved guides below the condensers, a series of pins carried by one of the condensers to prevent accumulation of fibers on the guide adjacent thereto, and air lock means into which the fibers are discharged from the guides to convey the fibers from the chamber to a region of different pressure.

ERNEST CLARK.