

June 30, 1931.

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1,812,412

MACHINE FOR HANDLING FIBROUS MATERIAL

Filed June 3, 1929

3 Sheets-Sheet 1

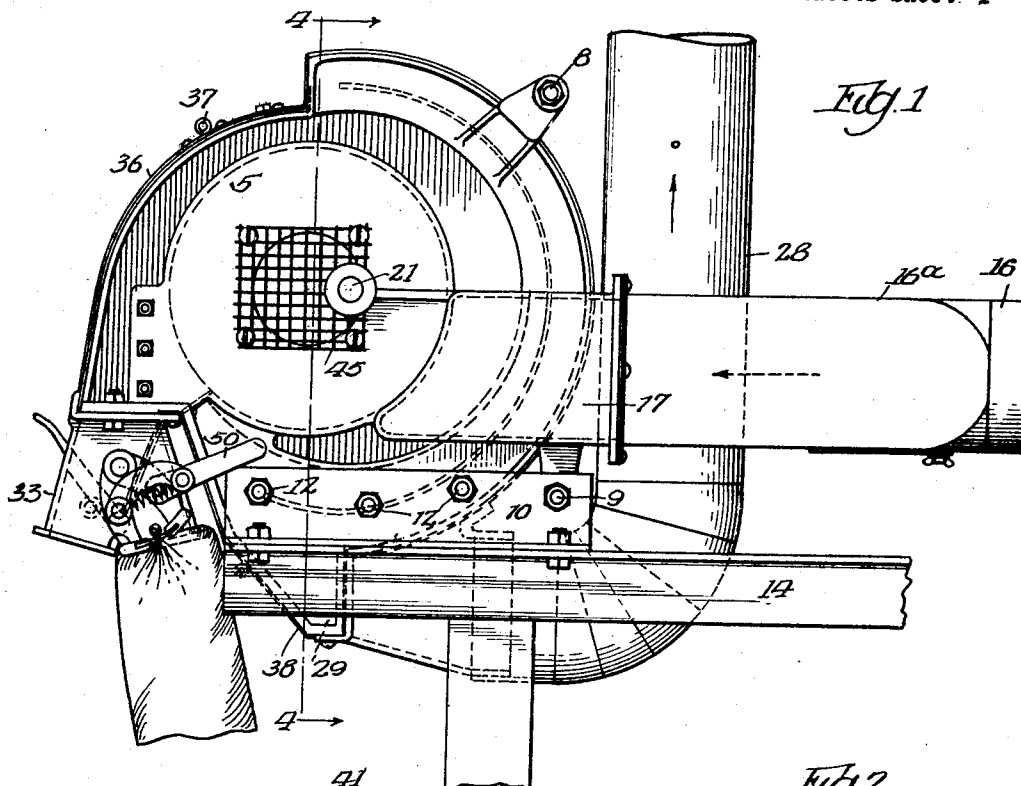


Fig. 1

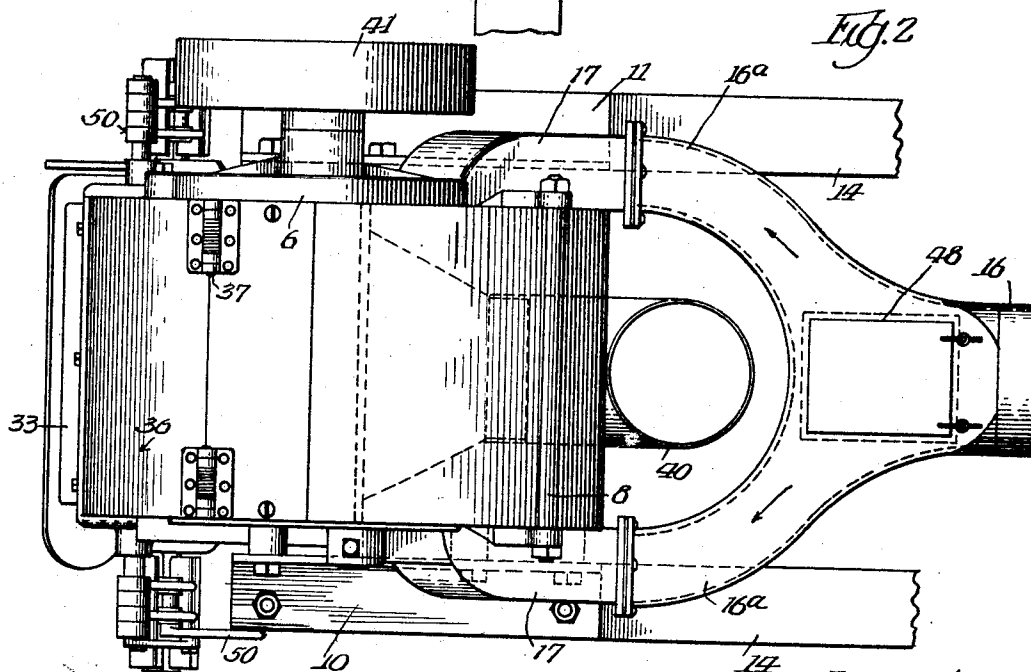


Fig. 2

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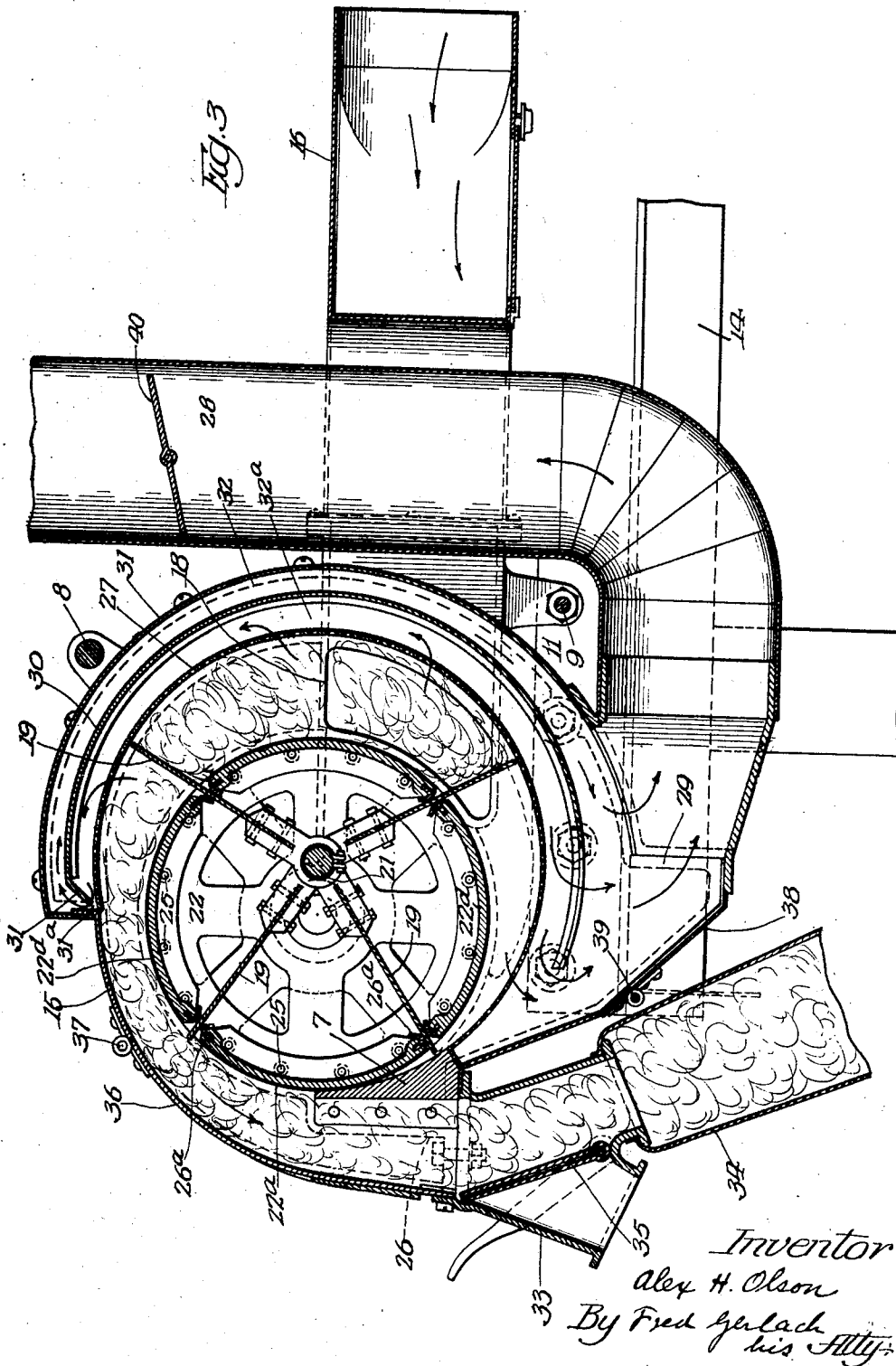
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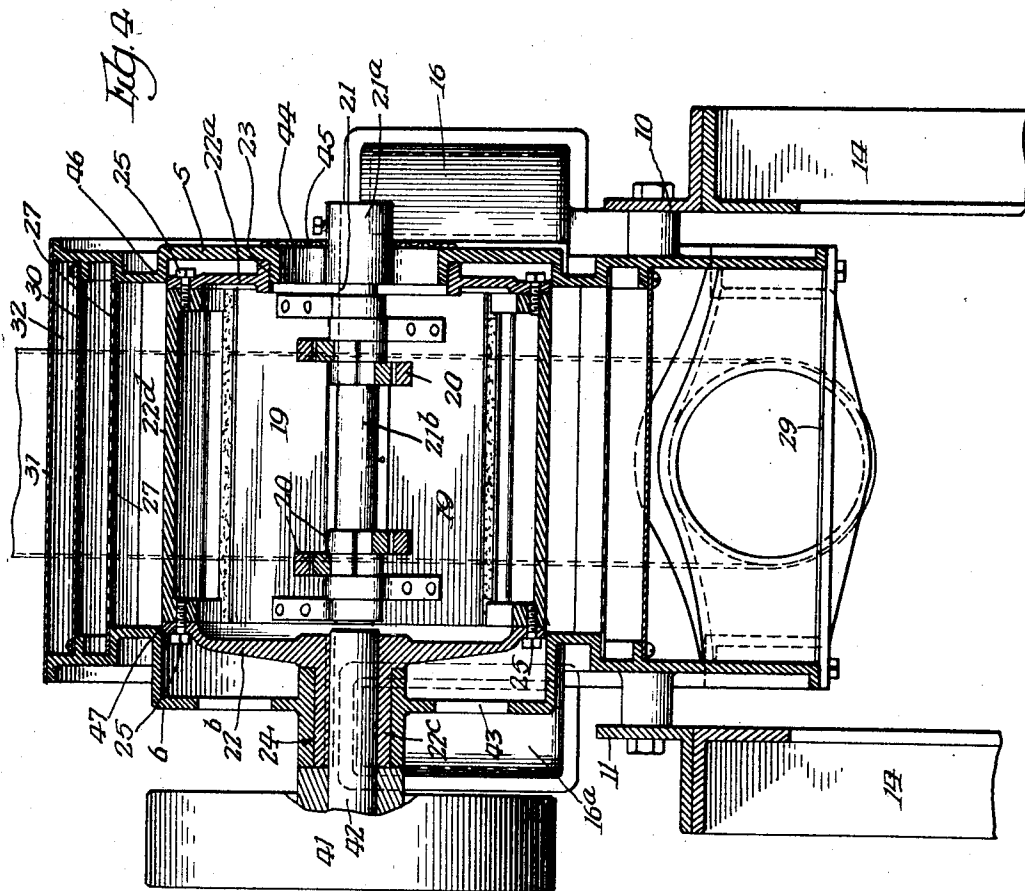
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MACHINE FOR HANDLING FIBROUS MATERIAL

Application filed June 3, 1929. Serial No. 363,035.

The invention relates to machines for handling fibrous material.

Heretofore it has been common practice in the making of mattresses to deliver fibrous material, such as cotton, into the ticking with air under pressure after the fibrous material has passed through a condenser or separator to remove the dust therefrom. In delivering the material into the mattress with or by air under pressure, the residual dust or fine particles in the material accumulate on the inner surfaces of the ticking because the air under substantial pressure escapes through the fabric and deposits the dust on the latter. This deposit is objectionable and necessitates beating of the mattress for its removal.

One object of the present invention is to provide a machine by which the fibrous material will be discharged into the ticking with little or no air pressure, so that any residual dust or the fine particles will remain distributed in the fibrous material, and will not be accumulated and deposited on the inner faces of the ticking.

Another object of the invention is to provide an improved machine into which the material is delivered by air under pressure which will separate the dust from the fibrous material and separately discharge the fibrous material and the air with the dust.

A further object of the invention is to provide an improved machine for separating dust from fibrous material, in which the material is positively forced through the casing and discharged separately from the air and dust.

Other objects of the invention and the various advantages and characteristics of the present construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the sev-

eral views: Fig. 1 is a side elevation of a machine embodying the invention. Fig. 2 is a plan. Fig. 3 is a vertical longitudinal section. Fig. 4 is a transverse section on line 4-4 of Fig. 1.

The machine which forms the subject matter of the invention is adapted to deliver fibrous material such as cotton into mattresses and comprises a casing which is composed of complementary side frames or heads 5 and 6. The latter are rigidly secured together by a transverse bar 7 which is secured to the inner faces of said heads and tie rods 8 and 9. In addition to the heads the casing comprises a circumferential shell 15, which extends between and is secured to said heads. This casing is supported by angle bars 10 and 11, to which the heads 5 and 6 are secured by bolts 12. These bars 10 and 11 are rigidly secured to a suitable frame-work 14. A pipe 16 is connected to receive the fibrous material from a blower (not shown). The latter operates to deliver the fibrous material into the casing through branch ducts 16^a and inlets 17. These inlets are connected to the heads 5 and 6 and communicate with the inside of the casing through openings 18. By utilizing the branches and ducts, the material is delivered into both ends of the casing.

The fibrous material entering the casing is positively conveyed through the casing by a series of rotatable blades 19 which are secured respectively to pairs of arms 20 which are pivoted on a stationary shaft 21. These blades are rotatable by and radially slidable in a drum 22. The latter is composed of a head 22^a which is journaled on an inwardly extending bearing flange 23; a head 22^b, which has a hub 22^c journaled in a bearing 24 formed on the casing head 6; and a series of segmental plates 22^d which are secured by bolts 25 to said heads and extend between the blades 19 respectively. The ends of these plates are spaced apart to permit the blades 19 to slide between them, and packing strips 26^a are secured in the margins of the plates 22^d to form a tight closure between the plates 22^d and the blades 19, which will prevent the fibrous material and air from passing inwardly through the drum. The drum 22 rotates

about an axis which is eccentric with respect to the shaft 21, around which the blades 19 rotate, which causes the blades 19 to project from the drum at the side of the casing in which the fibrous material enters and positively force the fibrous material around the drum to the discharge side of the casing where the blades will be withdrawn to release the fibrous material and permit it to be discharged through an opening 26 in the casing. Shaft 21 is fixedly held in a lug 21^a which is formed on head 5 inside of bearing flange 23. A collar 21^b is secured to shaft 21 to hold the arms 20 and blades 19 against axial movement in the casing. A segmental screen 27, preferably formed of perforated sheet metal, extends around the inlet side of the casing and is concentric with the shaft 21, so that the outer ends of the blades 19 will sweep the inner periphery of the screen and prevent the accumulation of fibrous material or dust on the screen. This screen coacts with the rotary blades and drum to convey the fibrous material positively around the inlet side of the casing and also permits the air which conveys the fibrous material into the casing and the dust expelled from the material by the air, to escape through the screen, thus separating the air and dust from the fibrous material as it is conveyed to, and before it reaches, the discharge 26. An outlet pipe 28 for the air and dust is connected to an outlet 29 formed in the lower portion of the casing. A segmental baffle 30 extends across the casing, and extends substantially throughout the receiving side of the casing. This baffle is spaced from the screen so the air and dust passing through the portion of the screen adjacent inlets 18 will be directed downwardly to the outlet 29. The upper end of the baffle terminates adjacent the upper end of the screen, and is turned downwardly, as at 31, to a point close to the screen 27 to form a constricted outlet 31^a for the air and dust which pass through the upper portion of the screen. This restricted outlet will produce a sufficiently strong current or draft inside of the baffle to carry the dust away from the upper portion of the screen and prevent it from becoming clogged. By extending the baffle to that end of the screen which is remote from the point at which the outlet 29 is located, the air in the material and the movement of the material by the blades will keep the upper portion of the screen open, and prevent the accumulation of dust. The portion 31 of the casing extends around and is spaced from the baffle 30 to form a duct 32 through which air and dust from the constricted opening 31^a will pass to the outlet 29 and thence into the outlet pipe 28.

At the discharge opening 26 of the casing, a two-way spout 33 is secured to the casing. Each of the legs of this spout is adapted for connection to the ticking 34 of a mattress to

be filled. A valve 35 is pivoted in the spout 33 so the fibrous material may be discharged through either of the legs, so that the machine may be continuously operated, one ticking being attached to one of the legs, while another ticking attached to the other leg is being filled. A door 36 is hinged to the casing at 37 to permit access to the discharge side thereof. A door 38 is also hinged to the casing adjacent the air and dust outlet 29 to provide access to the casing.

A valve or damper 40 is provided in the air outlet pipe 28 so that the escape of air and dust may be regulated, particularly when the air and dust are to be conducted to a suction blower or dust collector. The drum 22 is driven by means of a pulley 41 which is fixed to a shaft 42 which is secured in the hub of the head 22^b. Openings 43 are formed in the casing head 6, and an opening 44, covered by a screen 45, is formed in the casing head 5, and openings are also formed in the heads 22^a and 22^b of the drum 22, so that no air pressure will be developed in the drum by the rotation of the blades 19 and drum. The peripheries of the drum heads 22^a and 22^b fit annular shoulders 46 and 47 on the heads 5 and 6 of the casing to confine the fibrous material and air to the casing and around the drum. A door 48 is provided on the lower side of the inlet pipe 16 to provide access to the pipe. The legs of spout 33 are equipped with clamping devices 50 of any suitable and well-known construction, which are adapted to secure the ticking on the legs in position to receive fibrous material discharged from the casing.

The operation of the machine will be as follows: Fibrous material, carried by a blast of air from a blower, will be forced through pipe 16, and delivered with the air through openings 18 into both ends of the casing at that side of the casing where the blades 19 project from the drum, and at which the segmental screen 27 is located. The fibrous material will be confined between the screen and the periphery of the drum, and blades 19 will positively force the material past the screen to the discharge side where the fibrous material will be conveyed between the casing and the drum to the discharge spout 33. The air which carries the material into the casing, being under pressure, will separate the dust from the fibrous material and escape with the dust through the screen 27 into the duct 32^a between the baffle 30 and the screen. The air and dust, which leaves the fibrous material adjacent the inlet openings 18, will pass through the screen and thence downwardly around the lower end of baffle 30 through outlet 29 into the discharge pipe 40. The fibrous material at the inlet side of the casing passes between the screen and the drum and past the upper end of the screen into the discharge side of the casing. The air under pressure and

the pressure of air developed by the rotation of the blades 19 adjacent the upper portion of the screen will pass therethrough and produce sufficient current to force the dust through the screen and thence through opening 31^a and around the upper end of the baffle 30 into duct 32 between the baffle and the casing, and to the outlet 29 and outlet pipe 28. As the fibrous material is carried beyond the screen 27, substantially all of the air and free dust will have been separated therefrom. The blades 19 will progressively force the fibrous material between the drum and the casing at the discharge side thereof so it will be delivered into the discharge spout 36 with substantially no air under pressure. As a result, the fibrous material will be discharged into the ticking without sufficient air pressure to cause the residual dust in the fibrous material to be separated from the mass in the casing so it will not collect on the inner faces of the ticking as the air escapes through the ticking. The damper 40 may be set to regulate the escape of air and dust, more particularly when the pipe 28 is connected to the suction side of a dust collector so that the suction will be insufficient to draw the fibrous material through the screen and into the outlet pipe.

The invention exemplifies a machine for handling fibrous material for delivery into receptacles, such as mattress tickings, which receives fibrous material in suspension in a blast of air under pressure, in which the air and dust are separated from the fibrous material, and the latter is delivered into the receptacle without sufficient air pressure to cause the residual dust to accumulate on the inner faces of the ticking.

The invention also exemplifies a machine for handling fibrous material which may be operated for a long period without becoming clogged with dust or small fibres, the rotary blades serving to sweep the screen, and sufficient air current being developed throughout the area of the screen to prevent the accumulation of dust on any portion thereof; also a machine of this character which is simple in construction and efficient in operation.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, means for positively conveying the fibrous material through the casing and positively discharging it from the casing through said

outlet, and means for separating air from the material in transit to the outlet.

2. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, rotary means for positively conveying the fibrous material through the casing and positively discharging it from the casing through said outlet, and means for separating air from the material in transit to the outlet.

3. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, means for positively conveying the fibrous material through the casing to said outlet, said last mentioned means comprising a rotatable drum and a plurality of blades extending through and movable relatively to the drum, and means for separating air from the material while the material is being conveyed through the casing by the blades.

4. In a machine of the character described, the combination of a casing comprising a pair of end walls and a continuous shell between the walls and provided with an outlet, means for delivering fibrous material with air under pressure into the casing through the end walls, rotary means for positively conveying the fibrous material through the casing and positively discharging it from the casing through said outlet, and means for separating the air from the material before the latter reaches the outlet.

5. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, a rotary drum in the casing, blades rotated by and movable relatively to the drum, for positively conveying the fibrous material through the casing and forcibly ejecting it through said discharge, means through which air and dust will pass while the material is being conveyed by the blades, and means forming a separate outlet for the air and dust.

6. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, a rotary drum in the casing, blades rotated by and slidable in the drum, for positively conveying the fibrous material through the casing and forcibly ejecting it through said discharge, a screen through which air and dust will pass while it is being conveyed by the blades, and means forming a separate outlet for the air and dust passing through the screen.

7. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, a rotary drum in the casing, blades rotated by

and eccentrically to the drum for positively conveying the fibrous material through the casing and forcibly ejecting it through said outlet, a screen through which air and dust will pass, and means forming a separate outlet for the air passing through the screen.

8. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, a rotary drum in the casing, blades rotated by and slidable in the drum, for positively conveying the fibrous material through the casing forcibly ejecting it through said outlet, a screen through which air and dust will pass while it is being conveyed by the blades, and means forming a separate outlet for the air and dust passing through the screen.

9. In a machine of the character described, the combination of a casing provided with an outlet, means for delivering fibrous material with air under pressure into the casing, blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said outlet, a screen coacting with the blades and through which air and dust will pass, a baffle spaced from the screen, and a discharge for air and dust connected to receive air and dust from both ends of the baffle.

10. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, rotary blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a segmental screen coacting with the blades, and through which air and dust will pass, a baffle in the casing and spaced from the screen, and a discharge for the air and dust connected to receive air and dust from both ends of the baffle.

11. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, a rotary drum and blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a segmental screen coacting with the blades, and through which air and dust will be separated from the material, a baffle spaced from and extending around the screen, and a separate discharge connected to receive air and dust from both ends of the baffle.

12. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, a drum and blades for positively conveying the fibrous material through the casing and positively discharging it from the

casing through said discharge, a segmental screen coacting with the blades, and through which air and dust will be discharged from the material, a curved baffle spaced from and around the screen, the casing having a wall spaced from and forming a duct around the baffle, and an outlet in the casing for air and dust, adjacent one end of the baffle, and connected by said duct to receive air and dust from its other end.

13. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, rotary blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a stationary segmental screen coacting with the blades, and through which the air and dust will be discharged from the material, a baffle spaced from and extending around the screen, an outlet in the casing connected to receive air and dust passing around one end of the baffle, and a restricted outlet between the other end of the baffle and the screen to deliver the air and dust from the other end of the screen to the outlet.

14. In a machine of the character described, the combination of a casing provided with a discharge, means for delivering fibrous material with air under pressure into the casing, rotary blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a stationary segmental screen coacting with the blades, through which air and dust will be discharged from the material, a baffle spaced from and extending around the screen, an outlet connected to receive air and dust, adjacent one end of the baffle, and means to produce sufficient air current to convey the dust away from the other end of the screen and to the outlet.

15. In a machine of the character described, the combination of a casing provided with a discharge at one side thereof, means for delivering fibrous material into both ends of the casing with air under pressure, rotary blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a screen coacting with the blades and through which the air and dust will pass as the material is conveyed by the blades, and means for discharging from the casing, the air and dust, separately from the fibrous material.

16. In a machine of the character described, the combination of a casing provided with a discharge spout, means for delivering fibrous material into the casing with air under pressure, rotary blades for positively conveying the fibrous material through the casing and positively discharging it from the casing through said discharge, a segmental screen

coacting with the blades and through which the air and dust will pass, and an outlet for discharging the air and dust from the screen separately from the fibrous material.

5 17. In a machine of the character described, the combination of a casing provided with inlets at one side and with an outlet at the other side, means for delivering fibrous material with air under pressure to said inlets,
10 rotary blades for positively conveying the fibrous material through the casing and from said inlets to and from said outlet, a segmental screen coacting with the blades and through which the air and dust will pass, and
15 means for separately discharging the air and dust.

Signed at Chicago, Illinois, this 27th day of May, 1929.

ALEX H. OLSON.

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