Sept. 30, 1924. 1,510,252

E. G. WILHELM

PNEUMATIC FEEDING MECHANISM

Filed July 26, 1921 3 Sheets-Sheet 1

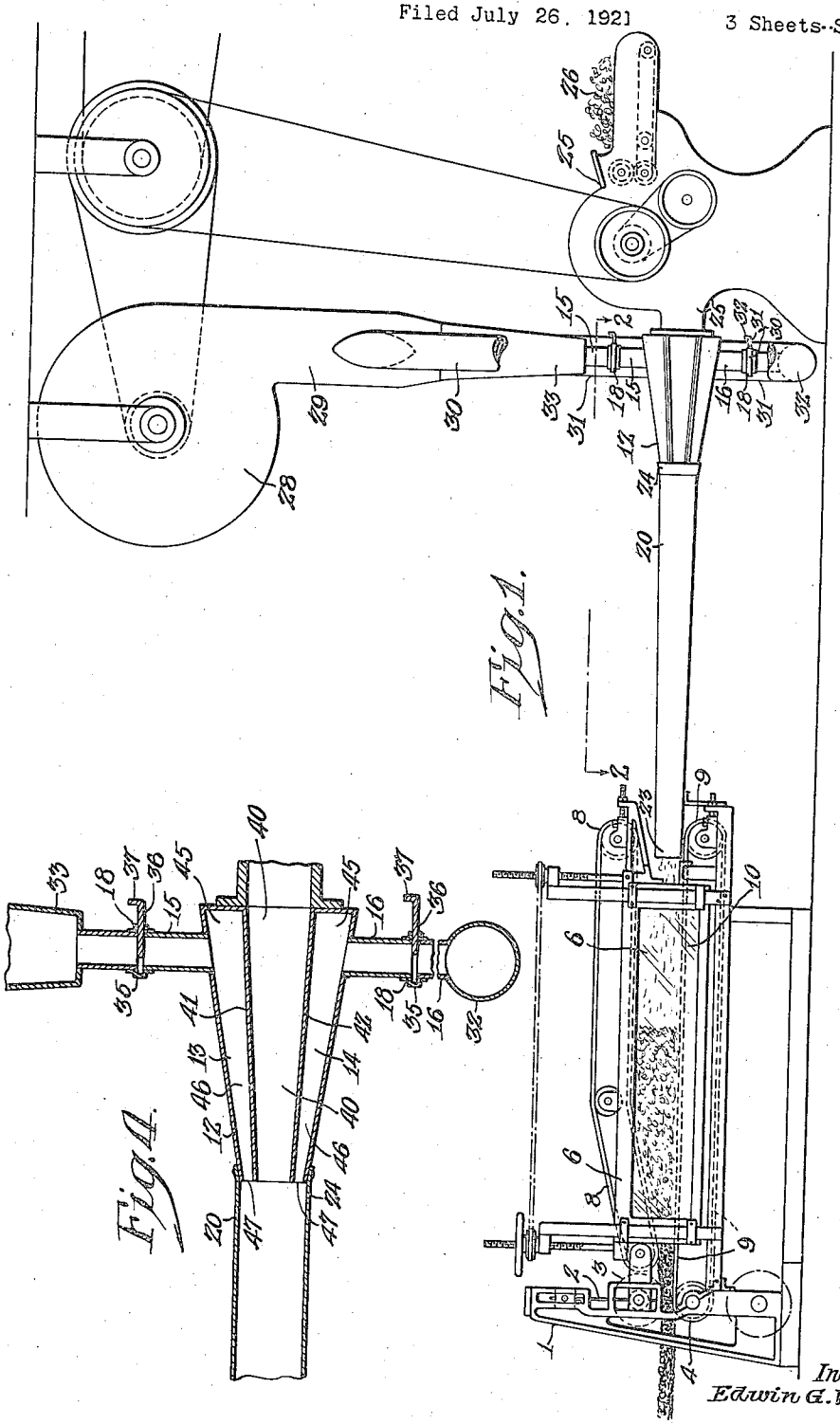


Fig. 1.

Fig. 4.

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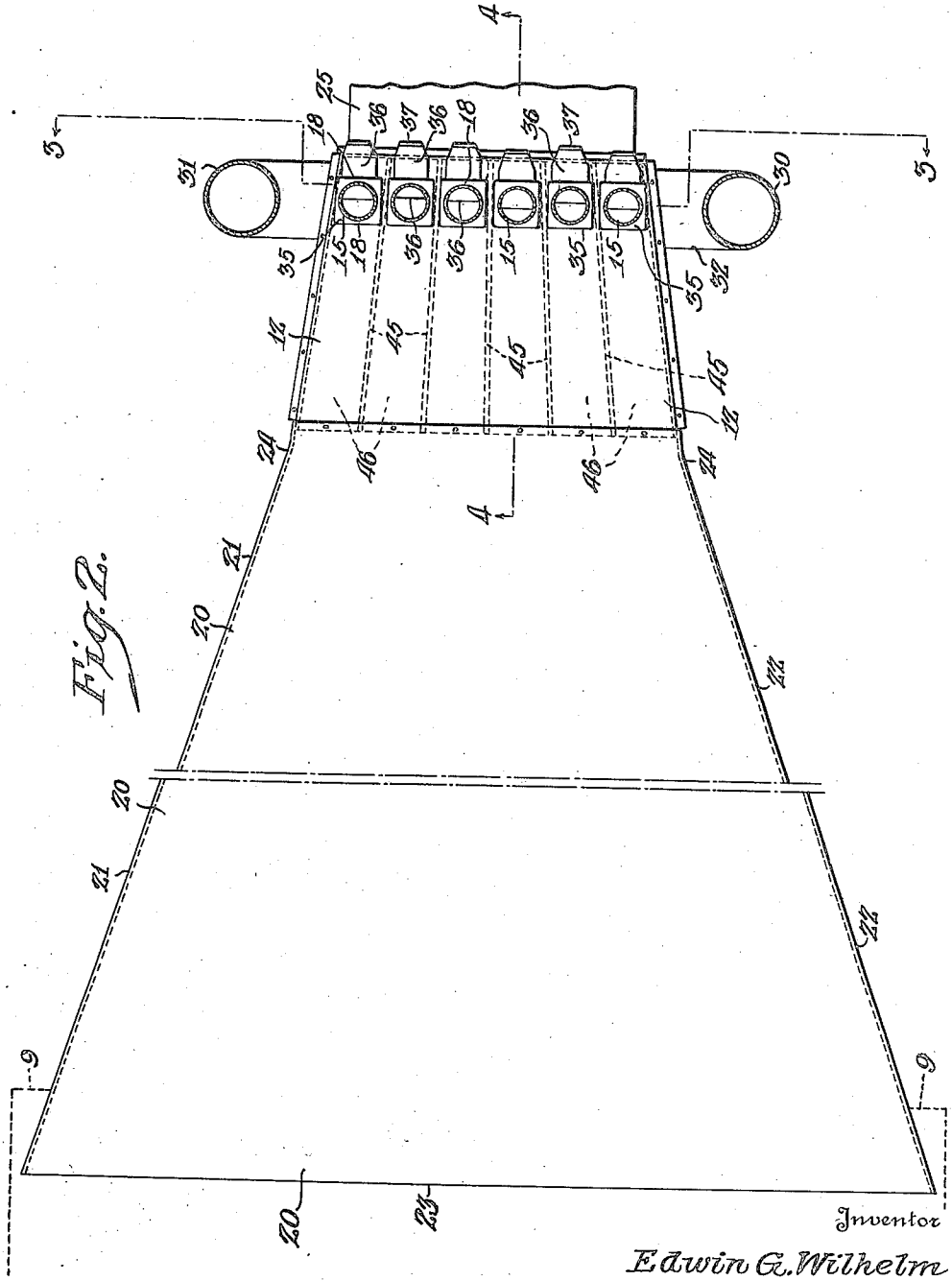


Fig. 2.

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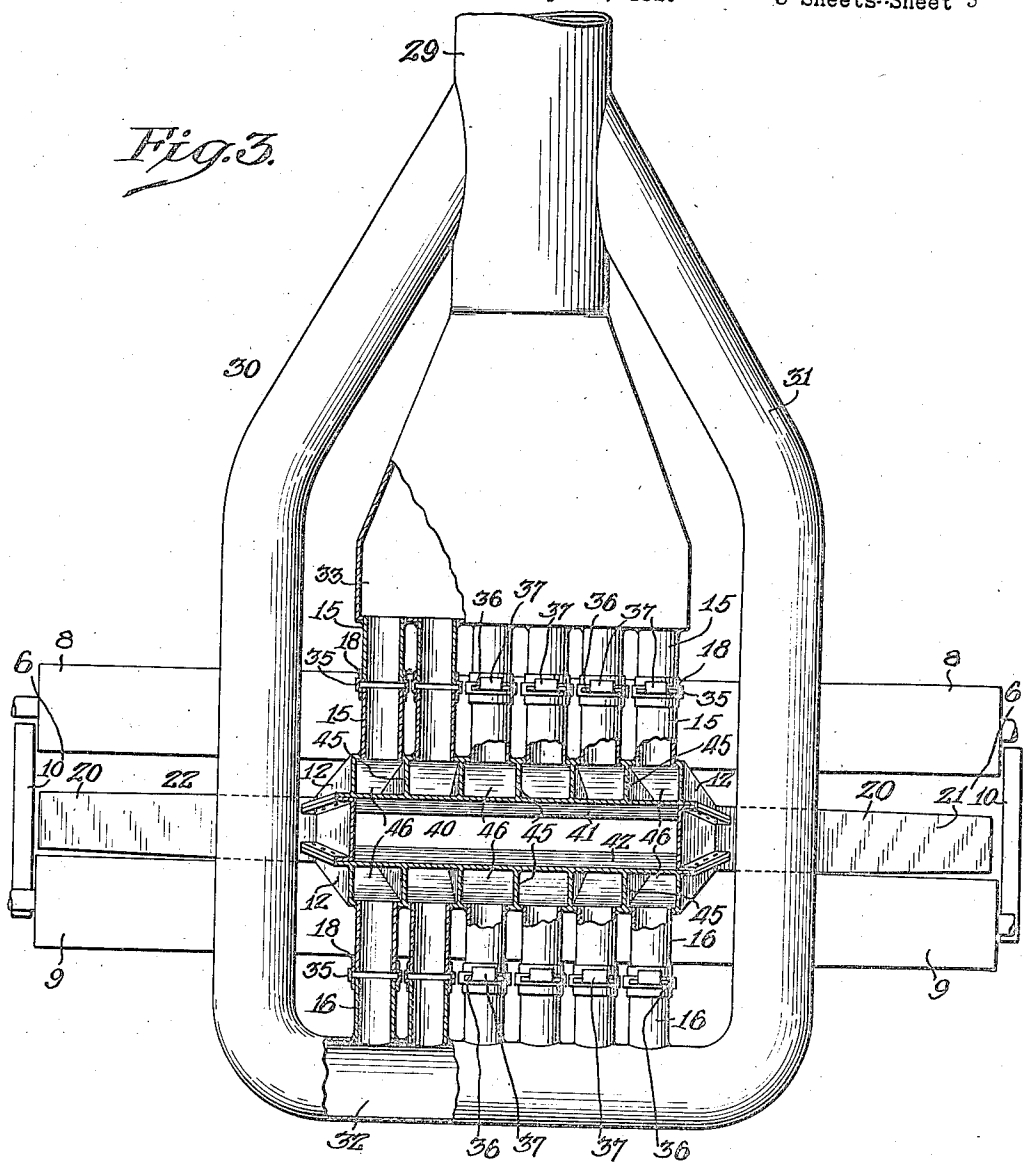
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Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWIN G. WILHELM, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO HENRY WILHELM COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PNEUMATIC FEEDING MECHANISM.

Application filed July 26, 1921. Serial No. 487,697.

To all whom it may concern:

Be it known that I, EDWIN G. WILHELM, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Feeding Mechanism, of which the following is a specification.

This invention relates to improvements in pneumatic feeding mechanism for material treating machines and particularly relates to feeding mechanism for machines for interlacing curled hair or fiber.

The object of the invention is to provide pneumatic feeding mechanism having means for regulating the flow of air, whereby the loose material, as it is carried through the feeding mechanism by the blast of air, may be directed so as to increase or diminish the quantity of material at various points. A further object of the invention is to provide a casing through which the loose material is forced by a blast of air into a delivery tube, and to construct said tube so that its outlet end will extend the full width of the interlacing machine, and which may be placed in a fixed position; a further object of the invention is to construct the casing with separate passageways or ducts for the air and to provide valves in the pipes leading to said air ducts for regulating the quantity of air passing through the ducts, so that the material, as it passes through the casing, may be directed to different portions of the delivery tube, or the air entirely shut off from different portions of casing whereby more or less material may be delivered to different portions of the receiving end of the interlacing machine, and thus form a uniform column of material.

These, together with various novel features of construction and arrangement of the parts constitute the invention which will be more fully hereinafter described and claimed.

In the accompanying drawings:

Fig. 1, is a side elevation of the improved feeding device, shown partially in section;

Fig. 2, is a plan view of the delivery tube and the air box or casing, shown in Fig. 1, partially in section, as on line 2—2 Fig. 1, and drawn on a larger scale;

Fig. 3, is a transverse section on line 3—3 Fig. 2; and

Fig. 4, is a vertical longitudinal section on line 4—4 Fig. 2.

Referring to the accompanying drawings in which like reference characters refer to like parts, 1 represents a machine for interlacing curled hair, or fiber, having reciprocating needles 2 for interlacing the material as it is passed between the rolls 3 and 4. A collecting box 6 is provided for forming the material into a rectangular column which is carried into the interlacing machine by endless belts 8 and 9, positioned between vertical side walls 10. The endless belts 8 and 9 are advanced towards the interlacing machine 1 so as to carry the column of material between them, and deliver it to said machine to be interlaced in a manner well known by those skilled in the art.

The improved feeding mechanism consists of a casing 12 forming a series of air chambers 13 and 14 having pipes 15 arranged above the casing 12 and a series of pipes 16 arranged below the casing. Said pipes 15 and 16 are provided with valves 18, by which the flow of air through the pipes may be regulated. The casing 12 is connected with a delivery tube 20, which is attached at one end thereof to the discharge end of the casing 12, and the other end of said tube 20 extends adjacent to the receiving end of the collecting box 6 of the interlacing machine. The delivery tube 20 forms a closed passageway through which the loose material is blown into the interlacing machine, or into the collecting box 6 of said machine.

The delivery tube 20, as shown in the plan view Fig. 2, is formed with flaring sides 21 and 22, increasing in width towards the outlet end thereof. Said tube 20 is approximately the width of the interlacing machine at its outlet end 23, and its inlet end 24 is smaller in width adapting it to be connected with the outlet end of the casing 12, which latter is of less width than the interlacing machine, adapting the casing for use in connection with a standard form of picker 25.

The loose material 26 is first passed through the picker 25, which is of any suitable form, such as now in general use, for separating the material and freeing it of clumps and delivering it in loose form to the casing 12, at which point the loose material is subjected to a blast of air which

drives it through the delivery tube 20, and into the collecting box 6.

A fan 28 is provided for supplying a blast of air to the feeding device. The main supply pipe 29, from the fan, has branch pipes 30 and 31, which carry part of the air to the header 32, provided with the series of pipes 16 which are connected therewith. The main pipe 29 also has a header 33 connected therewith. The header 33 is provided with a series of the pipes 15.

The pipes 15 and 16 are each provided with a valve 18, comprising a box 35 forming parallel guides for the sliding valve plate 36 mounted in said valve boxes 35. Said plate 36 extends out through a confined opening formed in one side of the valve box 35, and is provided with a handle 37 for sliding said plate to open or close the valve.

The casing 12 is provided with a central passage-way 40 formed by the interior walls 41 and 42 for the material to pass from the picker 25 through the casing, where it is boosted by the blast of air and discharged from the tube 20 with sufficient force to form the material into a column in the collecting box 6.

The casing 12 is provided with vertical partitions 45 extending between the said wall 41 and the top wall of the casing 12, and also from the said wall 42 to the bottom wall of the casing, thus forming separate air ducts 46 through the casing 12, each of which is connected with a supply pipe 15 or 16, controlled by a valve 18. The casing 12 is of greater width at the outlet end than at the inlet end, as shown in Fig. 2, and the vertical partitions 45 radiate slightly and are thus separated a greater distance from each other at the outlet end of the casing, so that the partitions tend to distribute the material evenly throughout the full width of collecting box 6, or the interlacing machine 1.

The casing 12 tapers towards the outlet end in vertical section, as shown in Fig. 4, so that the outlets 47 of the air ducts or passageways 46 will be contracted, causing the air to travel at a greater speed where it enters the passage-way 40, formed through the central part of the casing 12, thus forcing the loose material through the distributing tube 20 with great speed.

The valves 18 are provided for the purpose of controlling the feeding of the material into the collecting box 6. Should the material collect faster in the center of the collecting box than at the sides thereof, the valves 18 of the passageways in the center of the casing 12 may be partially closed to reduce the flow of air through the central passageways, and thus reduce the quantity of material which will be fed into the center of the collecting box 6. If the material collects too rapidly at the sides of the collecting box, the valves leading to the central passageways may be opened and the valves in the outer passage-way partially closed. By providing each of the air passage-ways 45 with a separate valve, the feeding device may be regulated so that the material will be blown into the collecting box 6, and form a uniform column of material, and the material will pass through the interlacing machine in uniform thickness and weight.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. A feeding device for a material treating machine comprising a delivery tube having its outlet positioned adjacent to the receiving end of said machine and co-extensive in width with the width of the receiving end of said machine, a passage-way formed in the opposite end of the said tube for the entrance of loose material into said tube, separate air ducts leading to the inlet end of said tube, said air ducts having their outlet ends terminating within the tube and adjacent to the outlet end of said passageway, air supply pipes connected with said air ducts, and means for regulating the flow of air through said separate air ducts for forcing the loose material through the said tube.

2. A feeding device for a material treating machine comprising a delivery tube having its outlet positioned adjacent to the receiving end of said machine and co-extensive in width with the width of the receiving end of said machine, said tube having flaring side walls making the inlet end of the tube narrower than the outlet end, said tube having a passageway formed in the inlet end thereof for the entrance of loose material, a casing located at the inlet end of said tube, said casing having vertical partitions forming air ducts communicating with said tube, said partitions being positioned a greater distance apart at their outlet ends than at their inlet ends adapted to direct air into the inlet end of said tube and force the material divergently throughout the width of the tube, and means for regulating the flow of air through said ducts.

3. A feeding device for a material treating machine comprising a delivery tube having the outlet end thereof positioned adjacent to the receiving end of said machine, a casing connected with the delivery tube at the inlet end thereof, said tube having flaring side walls, making the outlet end thereof approximately the width of the receiving end of said machine, said casing having a passageway formed through the same for the entrance of loose material, said casing having air ducts leading to the said passage-way for blowing the material through the delivery tube and valves for controlling the quantity of air flowing through the said air ducts for directing the loose material to

different parts of the receiving end of the said machine.

4. A feeding device for material treating machines comprising a delivery tube, having its outlet end positioned adjacent to said machine, a casing connected with the delivery tube at the inlet end thereof, a passageway formed through the casing through which loose material may pass into said tube, pipes for supplying air to the casing, partitions in said casing forming air ducts leading to the said passage-way adapted to move the material through said passage-way and through the tube, and valves for controlling the flow of air through said ducts.

5. A feeding device for a material treating machine comprising a casing, walls extending through the casing forming a passage-way for loose material through the casing, said walls dividing the casing into separate air chambers located at either side of the said passage-way, air supply pipes connected with said air chambers, said air chambers having outlets leading from the said air chambers into the said passage-way for sucking the loose material through the said passage-way and blowing it into the said machine, and means for forcing a blast of air into said supply pipes.

6. A feeding device for a material treating machine comprising a casing, walls extending through the casing forming a passage-way for loose material through the casing, vertical partitions within the casing forming separate air ducts adjacent to the said passage-way formed by said walls, air supply pipes connected with each of said air ducts, said casing having openings formed therein leading from the separate air ducts into the said passage-way for moving the material through the said passage-way by a blast of air passing through the air ducts, and means for supplying air to the said supply pipes.

7. A feeding device for a material treating machine comprising a casing, walls extending through the casing forming a passage-way for loose material through the casing, said walls dividing the casing into upper and lower chambers, vertical partitions in said casing dividing said chambers into separate air ducts having openings communicating at the ends of the said air ducts with the said passage-way formed between said walls, a separate air supply pipe leading to each of said air ducts, a valve in each supply pipe for regulating the flow of air through said supply pipes, and a tube connected with said casing through which the material is blown into the said machine.

8. A feeding machine comprising a source of air supply, a picker for receiving loose material, a casing connected with the outlet end of the picker, said casing having a central passage-way formed therethrough, air ducts formed in said casing above and below the said central passage-way, a supply pipe from the source of air supply, headers in said supply pipe positioned above and below the casing, a series of pipes connecting the headers with each of said air ducts, valves for regulating the flow of air through the said air ducts, said air ducts having outlet openings communicating with the central passage-way for flowing the loose material through the said passage-way, and a delivery tube connected with the outlet end of said casing for directing the material into the said machine.

In testimony whereof I affix my signature.

EDWIN G. WILHELM.