Aug. 10, 1948. W. P. LEISTER 2,446,840

FIBER TREATING APPARATUS

Filed March 10, 1945 4 Sheets-Sheet 1

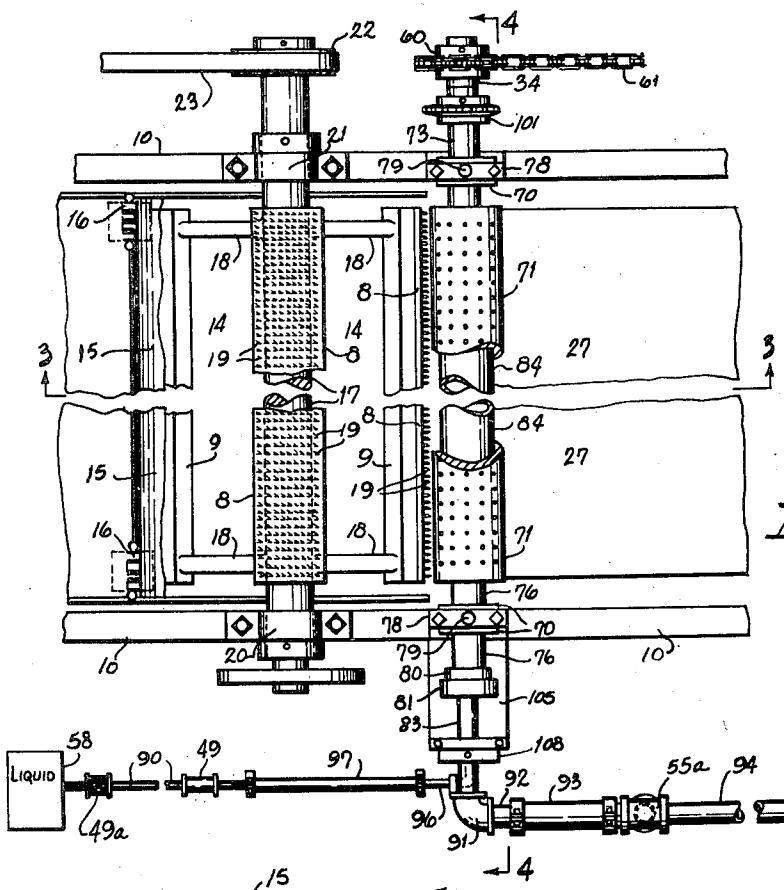

Fig-1

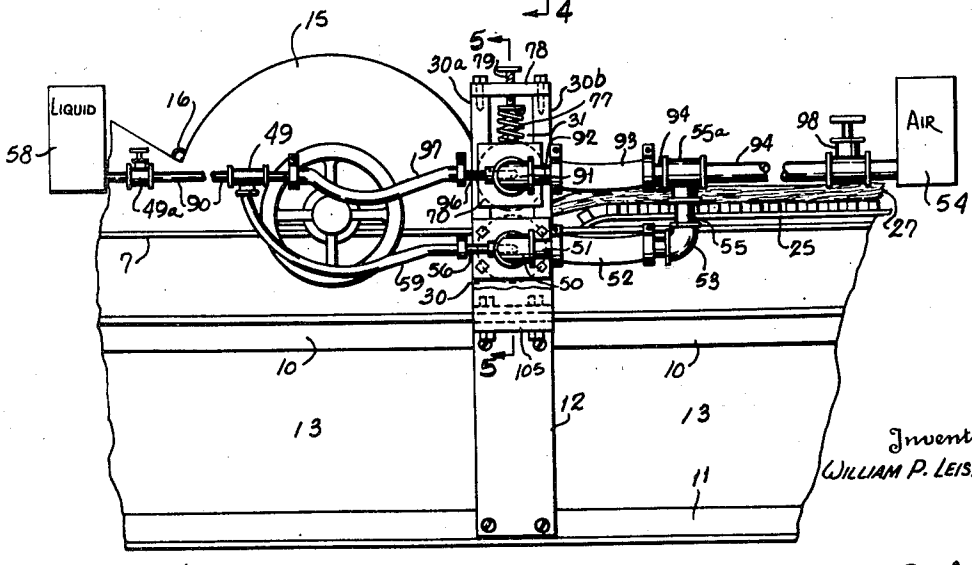

Fig-2

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FIBER TREATING APPARATUS

Filed March 10, 1945 4 Sheets-Sheet 2

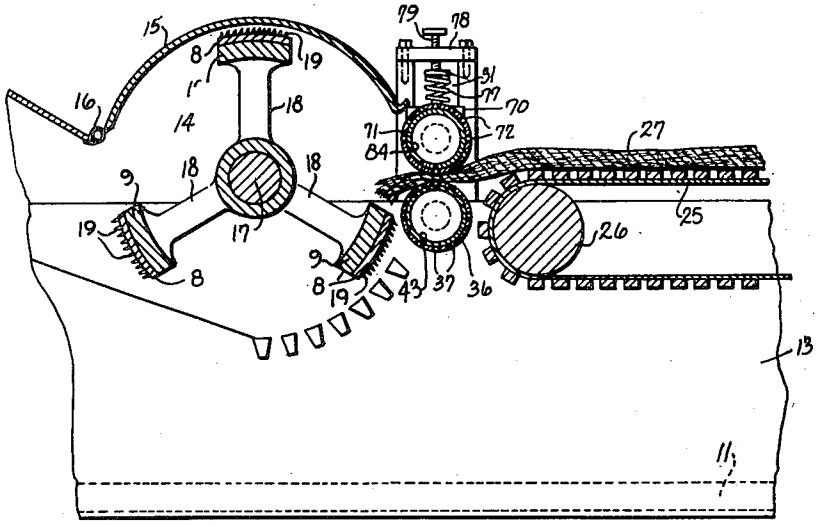

Fig-3

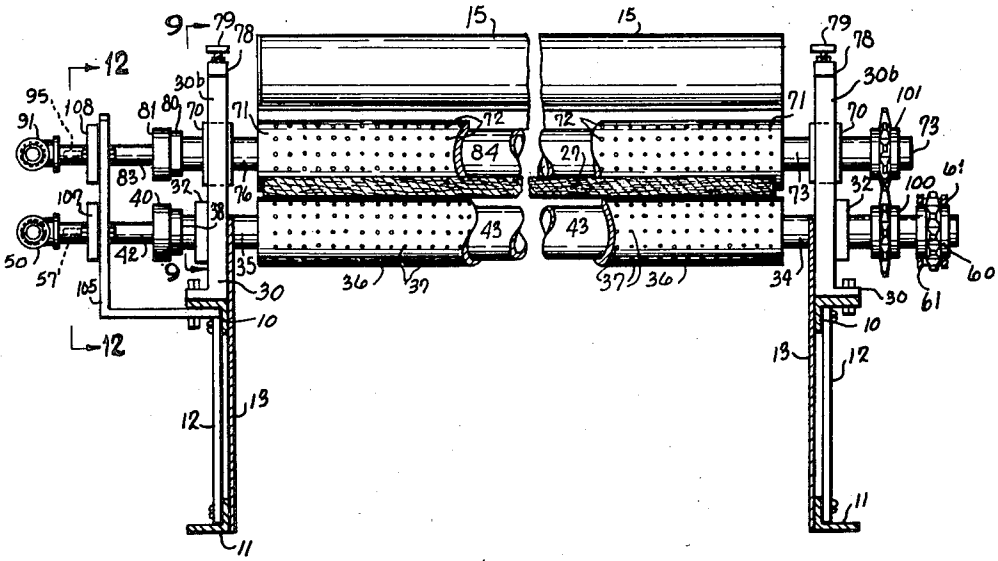

Fig-4

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FIBER TREATING APPARATUS

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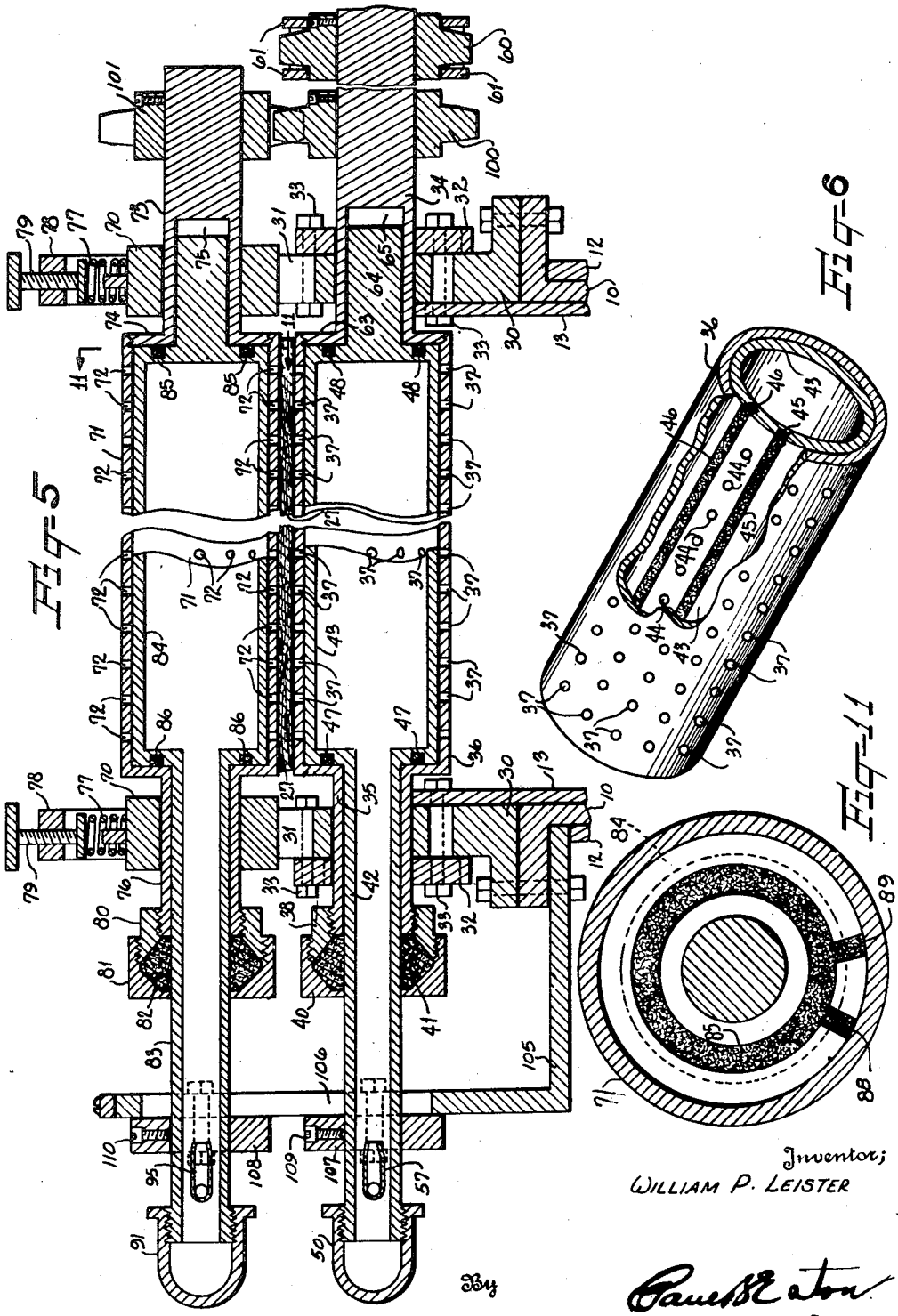

Fig-5

Fig-6

Fig-11

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Aug. 10, 1948. W. P. LEISTER 2,446,840

FIBER TREATING APPARATUS

Filed March 10, 1945 4 Sheets-Sheet 4

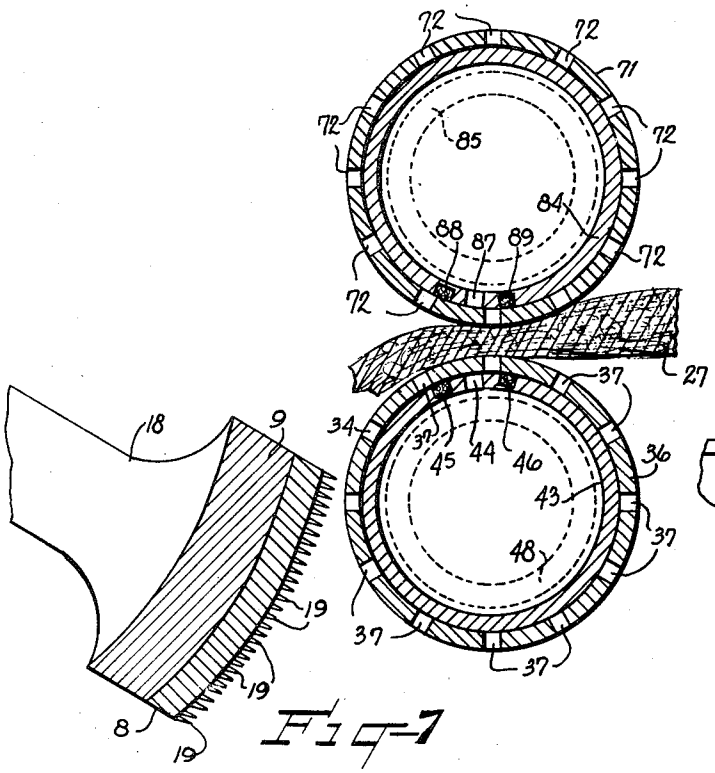

Fig-7

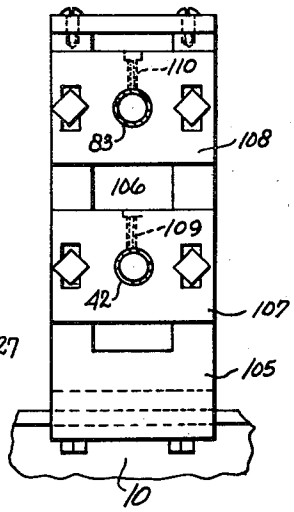

Fig-12

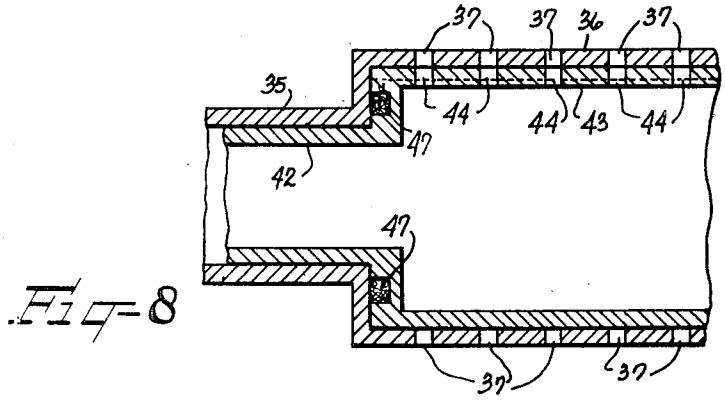

Fig-8

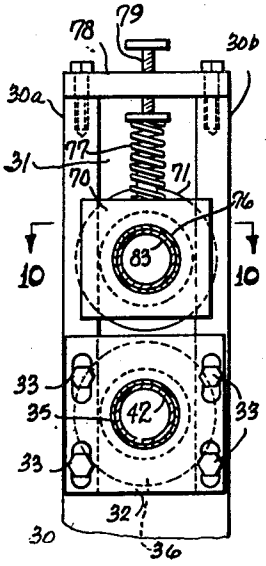

Fig-9

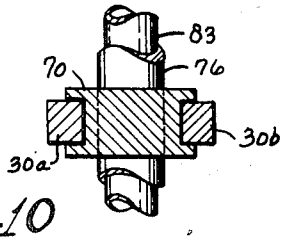

Fig-10

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2,446,840

UNITED STATES PATENT OFFICE

2,446,840

FIBER TREATING APPARATUS

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Application March 10, 1945, Serial No. 582,115

3 Claims. (Cl. 19—66)

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This invention relates to a picker used in the preparation of textile fibers such as cotton, wool and the like.

It is an object of this invention to provide a picker with means whereby as the web of fibers passes between the feed rolls into the beater chamber that a treating or working fluid can be injected onto the fibers immediately prior to their being torn from the web by the beater teeth of the beater disposed within the beater cylinder.

It is another object of my invention to provide in a picker, upper and lower feed rolls for feeding a web of fibers into the beater chamber, both the upper and lower rolls having means for introducing to the interior thereof, a fluid with the upper and lower feed rolls having perforations therein, and means controlled by the rotation of the feed rolls as the web of the fibers passes into the beater chamber for causing jets of the fluid, such as air, oil or the like, to be projected onto the web of fibers immediately before the beater teeth engage the web, the air being forced with sufficient velocity to tear the end of the web away from the main portion of the web after it is passed through the feed rolls and projecting the torn fibers into the beater chamber to better disintegrate the fibers and result in a more efficient parallelization of the fibers.

It is another object of this invention to provide a picker having upper and lower feed rolls through which a web of fibers is fed into the beater chamber of a picker, with the upper and lower feed rolls having perforations therein and having pipes mounted on the inside of the upper and lower feed rolls also provided with perforations, so that when the perforations in the inner pipes and the perforations in the feed rolls coincide, jets of air will issue through the coinciding perforations to strike the web of fibers after the fibers have passed between the feed rolls and to separate the end of the web from the main portion of the web and project the separated portions of the web into the beater chamber where it will be engaged by the beater teeth of the beater to more efficiently disintegrate the web and to parallelize the fibers in a better manner than has heretofore been obtained by causing the beater teeth to tear the fibers from the web as they enter into the beater chamber.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the acompanying drawings in which:

Figure 1 is a top plan view of a portion of a picker omitting the housing for the beater;

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Figure 2 is a side elevation of that portion of the picker shown in Figure 1 and looking from the lower side of Figure 1;

Figure 3 is a longitudinal sectional view taken along the line 3—3 of Figure 1;

Figure 4 is a transverse sectional view taken along the line 4—4 in Figure 1;

Figure 5 is a transverse sectional view with the central portion broken away and taken along the line 5—5 in Figure 2;

Figure 6 is an isometric view looking at the lower portion of one of the upper and lower rolls showing the coinciding holes between the inner and outer members of one of the upper or lower rolls;

Figure 7 is an enlarged vertical sectional view taken through the two rolls and a portion of the beater;

Figure 8 is a longitudinal sectional view through one end of one of the rolls and the air conveying means disposed therein;

Figure 9 is a vertical sectional view taken along the line 9—9 in Figure 4;

Figure 10 is a sectional plan view taken along the line 10—10 in Figure 9;

Figure 11 is a sectional view taken along the line 11—11 in Figure 5;

Figure 12 is a view along line 12—12 in Figure 4.

Referring more specifically to the drawings, the frame of the picker is represented by upper horizontal angle bars 10 and lower horizontal angle bars 11 with a plurality of uprights 12 and on the interior of this framework there is usually secured a sheet metal covering 13. These side frames are joined together by any suitable cross struts not shown. The picker has a conventional beater chamber 14 having its lid 15 pivoted as at 16 and encasing a beater comprising a shaft 17 and arms 18, which arms have bars 9 secured to their outer ends, on which strips 8 are secured, which strips have conventional teeth 19 therein. The shaft 17 extends outside of the frame at both ends and has the end portions thereof mounted in suitable bearings 20 and 21 mounted on suitable horizontal angle bars 7.

The shaft 17 has a suitable pulley 22 thereon, on which a suitable belt drive 23 is mounted and driven by suitable source of power, not shown. The picker also employs a lattice belt or endless conveyor 25, which is mounted on a roller 26 at one end, and the other end is mounted near the front of the picker, said mounting not being shown, and the lattice conveyor 25 is driven by any suitable source of power which is employed for driving the various parts of the picker.

In a conventional picker, whether it be a one process picker or a primary, intermediate, or finisher picker, a web of fibers 27 is fed by the lattice conveyor 25 in between a pair of feed rolls for feeding the web into the beater chamber where it is engaged by the teeth 19 and is torn away from the end of the web by the teeth in a manner well known.

Heretofore these feed rolls for feeding the web of fibers into the beater chamber have been solid or tubular material and it is an object of this invention to provide a special type of feed roll as will be hereinafter explained.

Mounted on the upper side of the horizontal angle bar 10 are bearing supporting members 30 and like reference characters will be employed in describing both of these bearing supports as they are identical. These upright bearing supporting members 30 have a vertically disposed slot 31 therein and in the lower portion of this slot there is adapted to be secured in each of the bearing supports 30 a bearing 32 by any suitable means such as bolts 33. This set of lower bearings 32 rotatably supports the necks 34 and 35 of lower feed roll 36. This lower feed roll 36 has a plurality of rows of perforations 37 therein through which air, treating liquid or other fluid is adapted to pass as will be hereinafter explained.

The neck 35 of the lower feed roll 36 is tubular and has a packing nut 38 threadably secured thereon. Threadably secured on this packing nut 38 is a second packing nut 40, having packing material 41 therein for contacting the tubular neck 42 of an inner tubular member 43 disposed within and closely fitting against the inside surface of the lower feed roll 36 but allowing rotation of the feed roll 36 relative to the tubular member 43. The tubular member 43 has a row of perforations 44 therein and on each side of this row of perforations are packing glands 45 and 46. The end walls of the tubular member 43 also have circular wicks 47 and 48 disposed in suitable grooves for preventing the escape of air or other fluid which is forced through the rows of perforations 44 when a row of perforations 37 in the outer cylinder or feed roll 36 coincide with the row of perforations 44. As will be seen in Figure 11, the upper tube 84 has its packing strips 88 and 89 extending into radial grooves in the end of the tube, likewise the packing strips 45 and 46 for the lower tube 43 extend into similar radial grooves in the end walls of the inner tube to complete the air seal.

The tubular member 43 with its neck 42, remains stationary at all times while the lower feed roll 36 rotates around the member 43 and its neck 42. The neck 42 is of greater length than the neck portion 35 of the outer feed roll and has threadably secured on the outer end thereof a suitable elbow 50 to which is connected a pipe 51 which has a length of hose 52 secured thereto at one end and the other end of the length of flexible piping or hose 52 is secured to an elbow 53, which is connected to nipple 55 which is connected to a T 55a in pipe 94 which is connected to a suitable source of compressed air 54. A valve 98 controls the flow of air through pipe 94.

Passing into the neck portion 42 is a pipe 56 which has a Pitot tube 57 disposed within the neck 42. The pipe 56 is connected to a suitable source of oil or other treating fluid 58 by being connected to a flexible pipe 59 which is connected to a T 49, which is connected by pipe 90 to tank 58. A valve 49a is disposed in pipe 90. The lower feed roll neck 34 has sprocket 60 secured thereon, on which is mounted a suitable sprocket chain 61 which is driven from a suitable source of power which drives the mechanism of the picker.

The neck 34 of the lower feed roll 36 has a disk or flared out portion 63 on the end thereof remote from the sprocket wheel 60 and this is threadably secured into an open end of the lower feed roll 43. The neck 34 is hollow for receiving a bearing shaft 64 which is integral with the end of inner perforated member 43, this bearing portion 64 fitting into a cavity 65 in the neck 34.

The slots 31 in the upper bearing supports 30 separate upright posts 30a and 30b of the bearing support 30 and mounted for vertical sliding movement in the slots 31 are bearings 70 which have grooves in their sides fitting around the posts 30a and 30b. These bearings 70 are adapted to rotatably support an upper feed roll 71 which is similar in all respects to the lower feed roll. The upper feed roll 71 has a hollow neck 73 mounted in a bearing 70 and this neck has integral therewith, a disk 74 which is threadably secured in the open end of the upper cylindrical feed roll 71. The bearing neck 73 has an elongated cylindrical cavity 75 therein, while the other end of the feed roll 71 has integral therewith a neck 76 which is mounted for rotation in the other bearing 70 at the other end of the feed roll. The bearings 70 are normally pressed downwardly by means of a compression spring 77 disposed in slot 31 and across the upper end of the posts 30a and 30b is secured a bar 78 in which is threadably mounted a thumb screw 79 which normally presses the spring 77 downwardly to urge the bearings 70 downwardly toward the lower roll 36.

The upper feed roll 71 is driven by means of neck 34 of lower feed roll 36 having a gear 100 secured thereon, which meshes with a gear 101 secured on neck 73. Threadably secured on the outer end of tubular neck 76 is a packing gland 80 which has threadably secured thereon a packing gland nut 81 which forces packing material 82 against a tubular neck 83 of inner fixed tubular member 84. The inner tubular member 84 has annular packing washers 85 in the right hand end in Figure 5 and also has an annular packing gland 86 in the left hand end as shown in Figure 5. Both ends of lower and upper inner tubes 43 and 84 have radial grooves therein into which the ends of packing strips 45, 46, 88, and 89 extend to abut against the annular packing glands 47, 48, 85, and 86. Inner member 84 also has a single row of perforations 87 and disposed on each side of this row of perforations are the packing strips 88 and 89. These strips 88 and 89 prevent leakage of air or other fluids past them and thereby prevents the fluid from passing out through any of the rows of perforations except that row which coincides with the row of perforations 37 in the inner member 84, as the strips 88 and 89 extend into radial grooves at each end until they contact annular packings 85 and 86.

The tubular neck portion 83 has threadably secured on its outer end an elbow 91 which is connected to a pipe 92 which has a flexible section of pipe 93 connected to one end thereof and the other end being connected to a pipe 94 which leads to T 55a and the source of compressed air 54.

A Pitot tube 95 is disposed in the tubular neck portion 83 and is connected to a pipe 96 which is connected to a flexible pipe 97 whose other end

is connected to valve 49 which is connected to a source of oil or other treating fluid 58.

Secured to angle member 10 is bracket 105 which extends outwardly and upwardly and has a slot 106 through which the necks 42 and 83 project. These necks penetrate blocks 107 and 108 adjustably mounted on the upright portion of bracket 105 and by means of set screws 109 and 110 these necks of the inner tubes can be secured against rotation. This arrangement also permits the adjustment of the angularity of the axes of the perforations 44 and 87 in the inner tubes to thus determine the point where the jets of air or treating fluid or both shall strike the fibers passing between the feed rolls.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only, and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. In a picker for textile fibers having a beater chamber and a pair of feed rolls, and means for conveying a web of textile fibers to the feed rolls to be passed between the feed rolls and into the beater chamber, the pair of feed rolls comprising an upper feed roll and a lower feed roll, each feed roll comprising an inner tube having an elongated neck portion extending from one end thereof and having a bearing portion, or stub shaft, extending from the other end thereof, a tubular feed roll surrounding the inner tube and having a neck portion extending from each end thereof, one of the neck portions of the tubular feed roll having the elongated neck portion of the inner tube passing therethrough and extending therebeyond, the neck portion on the other end of the feed roll having a cavity therein for rotatably receiving the stub shaft on one end of the inner tube, and having inter-connected driving means for imparting rotation to the feed rolls, the elongated neck portion of the inner tube extending outwardly and being supported by a suitable fixed bearing, means in the bearing for adjusting the position of the inner tube, each inner tube having a single row of perforations extending from one end to the other in a straight line, each feed roll being rotatably mounted around its inner tube and having a plurality of rows of perforations adapted to coincide, one at a time, with the single row of perforations in the inner tube, the perforations in the inner tube being adjusted to cause the jets of liquid under pressure issuing therefrom to be directed rearwardly and toward the lap of fibers being passed between the feed rolls, means for supplying a fluid under pressure through the neck portions of the inner tubes to the interior of the inner tubes, whereby the jets of fluid under pressure passing through the coinciding perforations will strike the web of fibers after it has passed from between the feed rolls to disintegrate and tear portions of the fibers away from the web.

2. In a picker for textile fibers having a beater chamber and a pair of feed rolls, and means for conveying a web of textile fibers to the feed rolls, to be passed between the feed rolls and the beater chamber, the pair of feed rolls comprising an upper feed roll and a lower feed roll, each feed roll comprising an inner tube having an elongated neck portion extending from one end thereof, and having a bearing portion, or

stub shaft, extending from the other end thereof, a tubular feed roll surrounding the inner tube and having a neck portion extending from each end thereof, one of the neck portions of the tubular feed roll having the elongated neck portion of the inner tube passing therethrough and extending therebeyond, the neck portion on the other end of the feed roll having a cavity therein for rotatably receiving the stub shaft on one end of the inner tube, and having inter-connected driving means for imparting rotation to the feed rolls, the elongated neck portion of the inner tube extending outwardly and being supported by a suitable fixed bearing, means in the bearing for adjusting the position of the inner tube, each inner tube having a single row of perforations extending from one end to the other in a straight line, each feed roll being rotatably mounted around its inner tube and having a plurality of rows of perforations adapted to coincide, one at a time, with the single row of perforations in the inner tube, the perforations in the inner tube being adjusted to cause the jets of liquid under pressure issuing therefrom to be directed rearwardly and toward the lap of fibers being passed between the feed rolls, means for supplying a fluid under pressure through the neck portions of the inner tube to the interior of the inner tube, whereby the jets of fluid under pressure passing through the coinciding perforations will strike the web of fibers after it has passed from between the feed rolls to disintegrate and tear portions of the fibers away from the web, the neck portions of the feed rolls which are rotatably mounted on the extended neck portions of the inner tube having a suitable packing joint on the outer end thereof for preventing escape of the fluid under pressure from between the inner tube and the feed roll rotatably mounted thereon, the neck portion of each feed roll at the other end of the inner tube having a disk-like portion threadably mounted in the end of the feed roll to completely encase the inner tube within the feed roll.

3. In a picker for textile fibers having a beater chamber and a pair of feed rolls, and means for conveying a web of textile fibers to the feed rolls to be passed between the feed rolls and into the beater chamber, the pair of feed rolls comprising an upper feed roll and a lower feed roll, between which the lap of fibers is passed, each feed roll comprising an inner tube having an elongated neck portion extending from one end thereof and having a bearing portion, or stub shaft, extending from the other end thereof, a tubular feed roll surrounding the inner tube and having a neck portion extending from one end thereof and a hollow bearing portion on the other end thereof the bearing portion on the other end of the feed roll having a bore therein for rotatably receiving the stub shaft on one end of the inner tube, and having interconnected driving means for imparting rotation to the feed rolls, the elongated neck portion of the inner tube extending outwardly and being supported by a suitable fixed bearing, means in the bearing for adjusting the position of the inner tube, each inner tube having a single row of perforations extending from one end to the other in a straight line, each feed roll being rotatably mounted around its inner tube and having a plurality of rows of perforations adapted to coincide, one at a time, with the single row of perforations in the inner tube, the perforations in the inner tube being adjusted to cause the jets

of liquid under pressure issuing therefrom to be directed rearwardly and toward the lap of fibers being passed between the feed rolls, means for supplying a fluid under pressure through the neck portions of the inner tube to the interior of the inner tube, whereby the jets of fluid under pressure passing through the coinciding perforations will strike the web of fibers after it has passed from between the feed rolls to disintegrate and tear portions of the fibers away from the web, the inner tube having longitudinally extending grooves disposed on each side of the single row of perforations, and a packing strip disposed in said grooves and resiliently engaging the inner surface of the feed rolls to prevent escape of fluid under pressure, and the ends of the inner tube having annular grooves therein, in which a packing ring is disposed, the packing strip in the longitudinally extending groove in the periphery of the inner tube extending radially on the end of the inner tube to engage the packing gland in the annular groove.

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