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J. W. NIMS, SR

2,487,361

PNEUMATIC MEANS FOR SPINNING FRAMES

Filed May 11, 1948

3 Sheets-Sheet 1

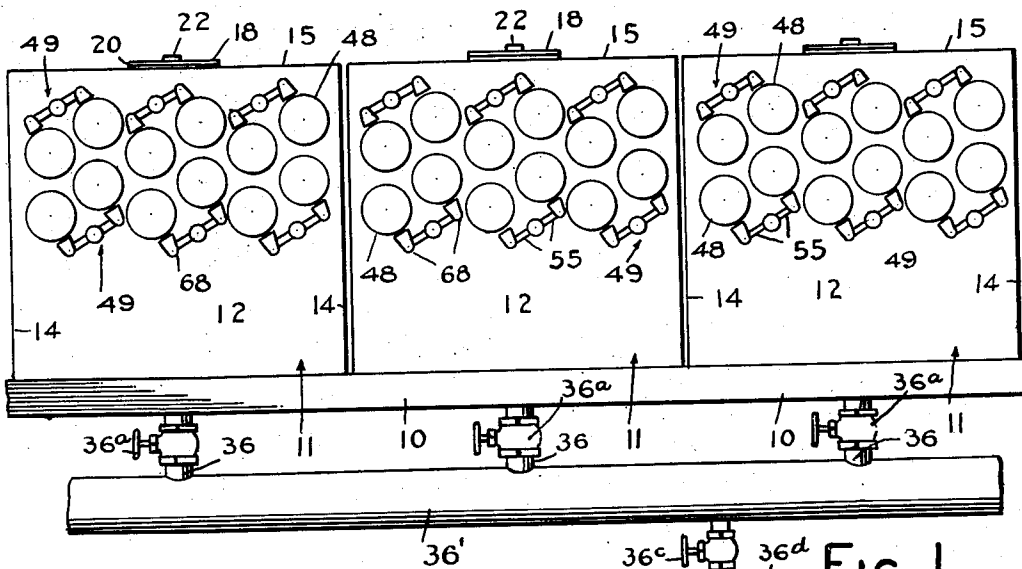


FIG. 2.

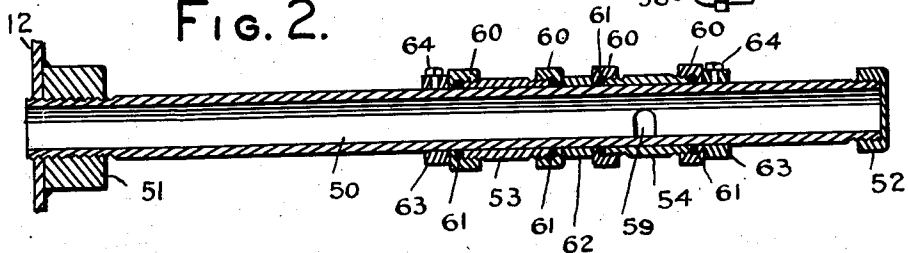


FIG. 4.

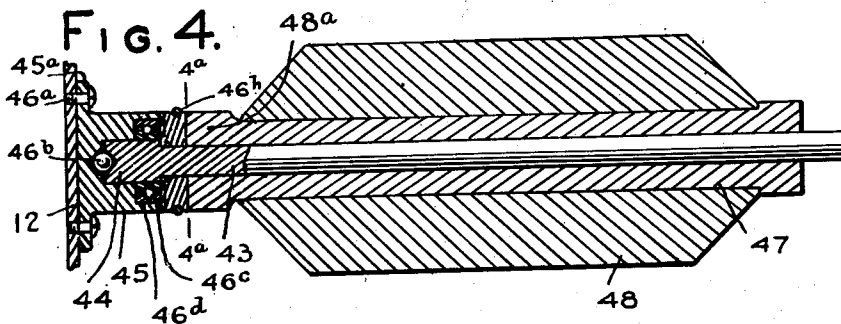


FIG. 3.

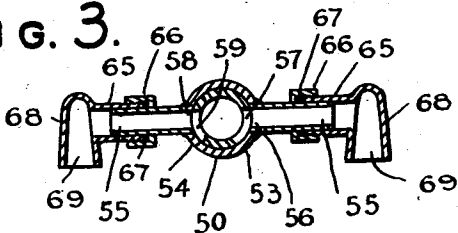
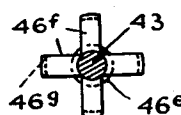


FIG. 4a.

INVENTOR
JOSEPH W. NIMS, SR.

Boyd Williams
ATTORNEYS.

Nov. 8, 1949

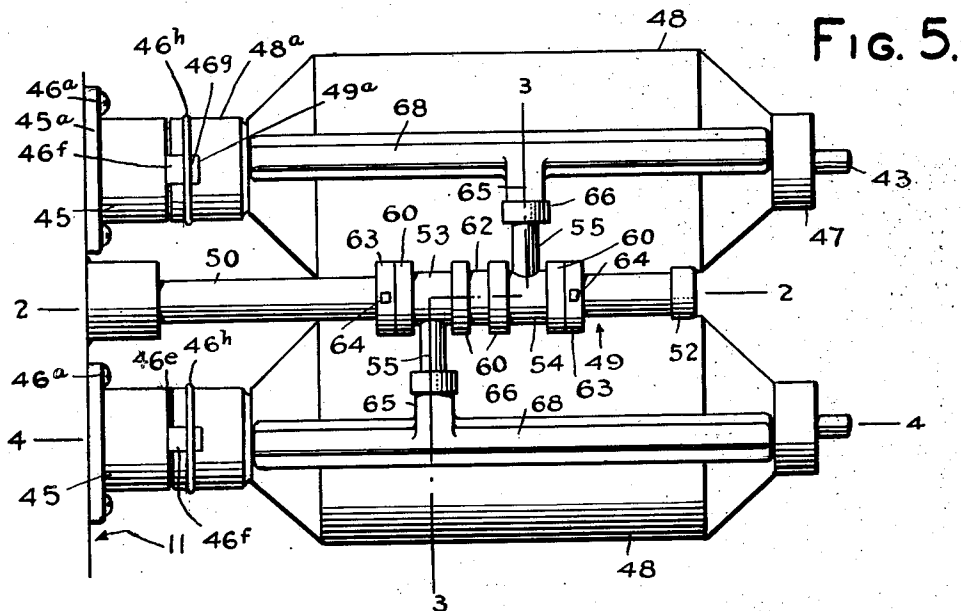
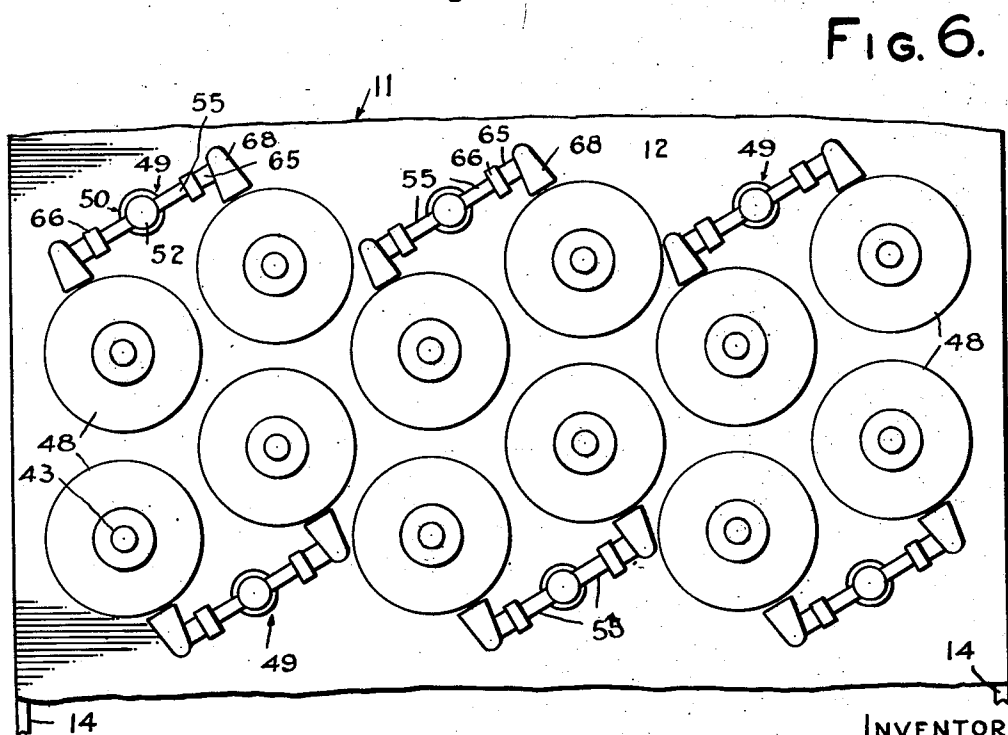
J. W. NIMS, SR

2,487,361

PNEUMATIC MEANS FOR SPINNING FRAMES

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INVENTOR
JOSEPH W. NIMS, SR.

Boyer

ATTORNEYS

Nov. 8, 1949

J. W. NIMS, SR

2,487,361

PNEUMATIC MEANS FOR SPINNING FRAMES

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FIG. 7.

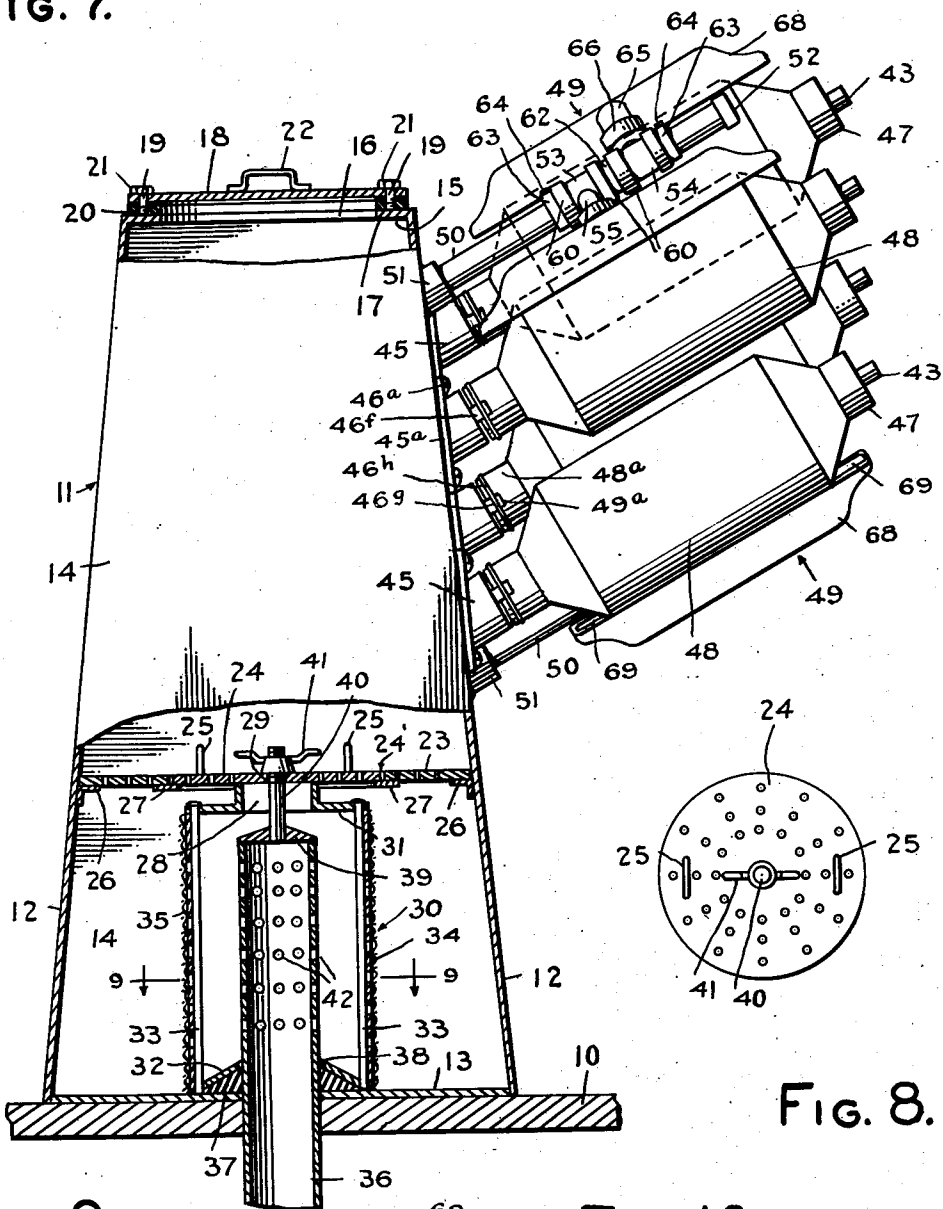


FIG. 8.

FIG. 9.

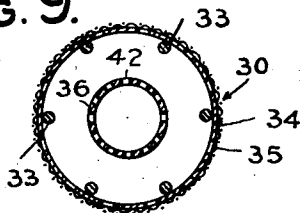
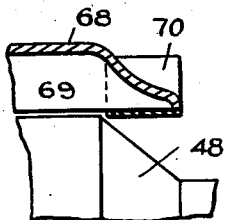


FIG. 10.



INVENTOR
JOSEPH W. NIMS, SR.

Boj M. Nims

ATTORNEYS

UNITED STATES PATENT OFFICE

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PNEUMATIC MEANS FOR SPINNING FRAMES

Joseph W. Nims, Sr., Lancaster, S. C.

Application May 11, 1948, Serial No. 26,464

10 Claims. (Cl. 57—56)

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My invention relates to spinning frames and pneumatic means to clean the roving or yarn upon the bobbins.

An important object of the invention is to provide individual suction means arranged close to each bobbin, and adjustable to follow the roving or yarn as the size of the wound roving decreases.

A further object of the invention is to provide means for collecting and holding the dirt or lint which has been removed from the roving or yarn, and which is so constructed that parts thereof may be removed for cleaning or repair.

A further object of the invention is to provide a vacuum tank as a source of suction, which tank also serves as a support for the skewers and the pipes carrying the suction nozzle, such tank being mounted upon the top of the spinning frame.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation, partly diagrammatic, of apparatus embodying my invention,

Figure 2 is a longitudinal section taken on line 2—2 of Figure 5,

Figure 3 is a transverse section taken on line 3—3 of Figure 5,

Figure 4 is a longitudinal section taken on line 4—4 of Figure 5,

Figure 4a is a section through the skewer, taken on line 4a—4a of Figure 4, parts omitted,

Figure 5 is a plan view of a suction unit and an associated pair of bobbins,

Figure 6 is a true end elevation, upon an enlarged scale, of the suction units and pairs of bobbins carried by one tank, parts of the tank being broken away,

Figure 7 is an end elevation of one tank, parts in vertical section,

Figure 8 is a plan view of the partition-strainer,

Figure 9 is a horizontal section taken on line 9—9 of Figure 7, and

Figure 10 is a longitudinal section through an adjustable nozzle cap.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates the top of a conventional spinning frame. These spinning frames are ordinarily about 32 to 36 feet in length. I use separate vacuum tanks 11, as a

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source of suction for a given number of suction units. I ordinarily employ 16 separate suction tanks 11, and these tanks are rigidly mounted upon the top 10.

Each tank is preferably rectangular in horizontal cross section and tapers upwardly, and has upwardly converging sides 12, a bottom 13, vertical ends 14 and a top 15. The top 15 has a large opening 16 forming a flange 17. A cap 18 covers the opening 16 and is detachably secured to the flange 17 by bolts 19, passing through a rubber packing rings 20. These bolts are secured to the ring 17 and carry nuts 21. The cap 18 has a handle 22, for convenient manipulation. Any other suitable means may be employed to detachably connect the cap 15 with the flange 17, and to form a vacuum tight joint.

Mounted within the tank 11 near its longitudinal center is a horizontal strainer-partition 23, which is formed of perforated sheet metal, the apertures being sufficiently fine so that the strainer-partition will catch large particles of lint or the like. This strainer-partition has a central portion 24, Figures 7 and 8, and this central portion is removable and may be equipped with handles 25. The strainer-partition 23 is mounted upon angle irons 26, while the removable central portion rests upon a ring 27 rigidly secured to the outer portion of the strainer-partition and also rests upon an upstanding tube 28, as shown. The central removable portion 24 has an opening 29, as shown. The numeral 30 designates a cylindrical strainer element, including a circular top 31 carrying the tube 28 and an annular bottom 32, which is preferably inclined upwardly toward its center. The top 31 and bottom 32 are connected by an annular group of rods 33, which are spaced. The top and bottom and rods form a rigid cylindrical cage. Surrounding the rods is a side 34, which may be formed of perforated sheet metal, and surrounding this perforated side is a wire mesh 35, which mesh is fine and is about a 40 mesh.

Leading into the bottom of each tank 11 is a vertical pipe 36, having a gas tight fit with such bottom, and passing through rubber packing 37 beneath the inclined bottom 32 and an opening 38 in the inclined bottom. The top of the pipe 36 is closed by a head 39, welded or otherwise rigidly secured thereto, and this head has a rod 40 rigidly secured thereto. This rod is vertical and extends through the tube 28 and through the opening 29 and carries a winged nut 41. The upper portion of the pipe 36 has apertures 42, as shown. The pipe 36 cannot move with respect to the

tank 11 and may be soldered or welded to the bottom 13. When the nut 41 is screwed up, the central portion 24 is forced down against the tube 28, and the bottom 32 presses against the rubber packing 37, whereby this packing prevents any leakage between the pipe 36 and bottom 13. When the nut 41 is removed from the rod 40, the strainer portion 24 is removed from the opening 24', and the strainer unit 30 may be passed upwardly through the opening 24', the head 39 passing through the opening 38. All of these elements now enter the upper portion of the tank 11 and may be removed through the opening 16. The pipes 36 have valves 36a connected therein.

The pipes 36 correspond in number and arrangement to the tanks 11, and these pipes are connected a common pipe 36', Figure 1, which leads to a suitable source of vacuum or suction. The pipe 36' has a branch pipe 36b connected therein, equipped with a valve 36c. A flexible hose 36d is secured to the pipe 36b and may be employed to clean the individual tanks 11.

Each tank 11 carries skewers 43, which are vertically inclined and extend upwardly toward their free ends. Each skewer 43, Figure 4, has a shank 44, inserted within a sleeve 45. The sleeve 45 has a base 45a, rigidly secured to the tank 11 by screws 46a, welding or the like. Shank 44 is cylindrical and is rotatable within the sleeve and engages at its end a bearing ball 46b. The cylindrical shank 44 is held within a radial ball bearing 46c, the outer race of which has a press fit in an annular groove 46d and the inner race of which has a press fit upon the shank 44. The shank 44, Figure 4a, has a shoulder 46e and radial lugs 46f are welded or rigidly secured to this shoulder. These lugs are provided at their ends with grooves 46g for receiving a split resilient ring 46h. Each skewer 43 receives thereon a bobbin 47 having a roving or yarn 48. The lower end 48a of the bobbin has notches 49a to receive the lugs 46f, and the lower end 48a is retained spaced from the sleeve 45. The split resilient ring 46h is carried by the end 48a and engages within the grooves 46g. The bobbin is therefore removably mounted upon the skewer 43 and rotates therewith. The roving from the bobbins pass downwardly to the draft rolls and then to the bobbins upon which they are twisted and wound, in the conventional manner. As more clearly shown in Figure 6, the skewers 43 are arranged in spaced horizontal rows and there are three skewers in each row. The skewers in each horizontal row are disposed in staggered relation to the skewers in the next horizontal row. The skewers are also arranged in vertically inclined rows. The skewers are also disposed in upper inclined pairs and lower inclined pairs. These skewers carry the bobbins which are, of course, controlled in their arrangement by the skewers.

Suction units 49 are disposed outwardly of and near each upper and lower inclined pair of bobbins, the suction unit being arranged above the upper pair of bobbins and below the lower pair of bobbins. Each suction unit includes a vertically inclined pipe 50, disposed near and between a pair of skewers 43, and parallel therewith. The inner end of the pipe 50, Figure 2, has screw threaded engagement within a sleeve 51, rigidly mounted upon the outer face of the side 12 by welding or the like. The inner end of the pipe 12 is open and has communication with the tank 11, while its outer end is closed by a cap 52. Pivotaly mounted upon each pipe 50 are collars 53 and 54, Fig-

ures 3 and 5, carrying radial tubes 55, formed integral therewith, the collar 53 having an opening 56 leading into an opening 57 formed in the pipe 50. The collar 54 has an opening 58 leading into an opening 59 formed in the pipe 50. The collars 53 and 54 have their ends screw threaded for engagement with screw threaded glands 60, holding packing 61. Arranged between the inner glands 60 is a spacing ring 62, and stop rings 63 surround the pipe 50 and are clamped thereto by set screws 64 or the like. The glands and the packing form a vacuum tight joint between the sleeves 53 and 54 and the pipe 50. These sleeves have frictional engagement with the pipe 50, so that they may be turned upon the pipe, but the sleeves will remain in the adjusted position, unless manually moved therefrom. Slidably mounted upon the outer end of each tube 55 is a sleeve 65, the inner end of which is screw threaded for engagement with a screw threaded gland 66, having packing 67. The gland and packing form a vacuum tight joint between the radial tube 55 and the sleeve 65, which is adjustable longitudinally upon the tube 55 and may also turn thereon. The frictional engagement between these parts is such that the sleeve 65 will remain in the adjusted position until manually moved therefrom. Each sleeve 65 carries an elongated nozzle 68, having an inlet opening 69. The opening 69 extends for the entire length of the wound roving upon the bobbin. If desired, I may apply adjustable caps 70 upon the ends of the openings 69, so that the uncovered portions of these openings will correspond exactly to the wound portion of the roving next to the opening 69.

The nozzles 68 are arranged in close relation to the wound roving of each pair of bobbins, and substantially contact therewith. The diameter of each individual cylinder of wound roving may vary, and such diameter decreases as the roving is unwound therefrom. In order to obtain the desired suction action, the nozzle is swung closer to the bobbin, to bring its opening 69 close to the roving. The sleeve 65 may be longitudinally adjusted upon the radial tube 55, so that the nozzle will be retained in alignment with the diameter of the wound roving. It is thus seen that a suction nozzle is provided for each roving wound bobbin, which nozzle is adjustable, for the reasons stated. Each pair of nozzles is carried by the inclined pipe, which leads to the interior of the tank. I have shown each tank as equipped with six of these inclined pipes. Suction is transmitted to each tank through the pipe 36, connected with the common suction pipe 36'. The lint and dirt removed from the several roving bobbins of each tank group is drawn into the tank. The large particles of lint or dirt accumulate upon the screen-partition, while the finer particles accumulate upon the screen 35. The screen-partition and screen 35 and associated elements are removable for cleansing purposes.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangements of parts may be resorted to, without departing from the spirit of my invention or the scope of the subjoined claims. While I have shown the skewers and suction elements mounted upon one side 12 only of the tank 11, for the purpose of illustration, it is to be understood that these elements may be mounted upon both sides 75 of the tank.

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Having thus described my invention, what I claim is:

1. In spinning mechanism, a frame part, a tank mounted upon the frame part, skewers mounted upon the tank and carrying the bobbins of roving, pipes mounted upon the tank and leading to the interior of the same, suction nozzles mounted upon the pipes and adapted to be arranged near the roving, and means to create a suction within the tank.

2. In spinning mechanism, a frame part, skewers mounted upon the frame part and carrying the bobbins of roving, a suction nozzle for each bobbin, means to support the suction nozzle in close relation to the roving, and suction means having communication with the nozzles.

3. In spinning mechanism, a frame part, a skewer mounted upon the frame part for holding a bobbin of roving, a pipe mounted upon the frame part near the skewer, a tube pivotally mounted upon the pipe and having communication therewith, a suction nozzle mounted upon the tube to be arranged in close relation to the roving, and means to create a suction within the pipe.

4. In spinning mechanism, a plurality of pairs of skewers, a frame part upon which the skewers are mounted, a pipe arranged near each pair of skewers, radial tubes pivotally mounted upon each pipe and having communication therewith, suction nozzles carried by the radial tubes and adapted to be brought into close relation to the roving of the pair of bobbins, and means for creating suction within the pipes.

5. In spinning mechanism, a plurality of skewers for holding bobbins of roving or yarn, a suction nozzle arranged near each bobbin, a radial tube upon which each nozzle is longitudinally adjustably mounted, means to pivotally support each radial tube, and means to create a suction within each radial tube.

6. In spinning mechanism, a tank, skewers mounted upon the tank for holding bobbins of roving or yarn, pipes mounted upon the tank and arranged near the skewers and leading into the tank, each pipe having its outer end closed, each pipe having openings in its sides, sleeves pivotally mounted upon the pipe and having openings to communicate with the openings of the pipe, radial tubes mounted upon the sleeves, and nozzles carried by the radial tubes.

7. In spinning mechanism, a suction tank, a pair of spaced skewers mounted upon the suction tank for holding the bobbins of the roving or yarn, a pipe mounted upon the tank and arranged near and between the skewers and having its outer end closed and its inner end leading into the tank, radial tubes pivotally mounted upon the pipe and having communication with the pipe, nozzles longitudinally adjustably mounted

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upon the radial tubes, the nozzles being adapted to be brought into close relation to the roving, and means to create a suction within the tank.

8. In spinning mechanism, a tank having a side and an opening in its top, a removable cap for the opening, skewers mounted upon the side for holding bobbins of roving or yarn, pipes mounted upon such side and arranged near the skewers and leading into the tank, nozzles mounted upon the pipes and adapted to be arranged near the roving, a screen-partition arranged within the tank beneath the pipes and including an inner removable screen portion for forming an opening in the screen-partition, a cylindrical screen unit arranged beneath the removable screen portion and adapted to be passed through the opening of the screen-partition, a pipe extending into the bottom of the tank and having a perforated portion leading into the cylindrical screen unit, and means to create suction within the pipe.

9. In spinning mechanism, a suction tank having a side and top, said top having a main opening, a removable cap to cover the main opening, a plurality of skewers mounted upon the side of the tank, a plurality of pipes mounted upon the side of the tank near the skewers and leading into the tank, nozzles mounted upon the pipes to be arranged near the skewers, a screen-partition mounted within the tank beneath the pipes and having a removable screen portion providing an opening in the screen-partition, a tubular screen unit within the tank beneath the screen partition and having a tubular part at its top to engage with the removable screen portion, and having a bottom provided with an opening, a pipe extending through the bottom of the tank and the bottom of the tubular screen element and having apertures, compressible packing beneath the bottom of the screen element, a bolt connected with the end of the perforated pipe, and a nut carried by the bolt and engaging the upper face of the screen-partition.

10. In a spinning mechanism, a frame part, a tank mounted upon the frame part, sleeves mounted upon the tank, skewers having shanks rotatable within the sleeves, ball bearings within the sleeves engaging the shanks, lugs carried by the shanks, bobbins mounted upon the skewers and having notches to receive the lugs so that the bobbins rotate with the skewers, pipes mounted upon the tank and leading to the interior of the same, suction nozzles mounted upon the pipes and adapted to be arranged near the roving, and a suction device connected with the tank.

JOSEPH W. NIMS, Sr.

No references cited.