Nov. 8, 1932. D. S. SAMMIS 1,887,434

TUBE ACTUATING MACHINE

Filed Nov. 18, 1929

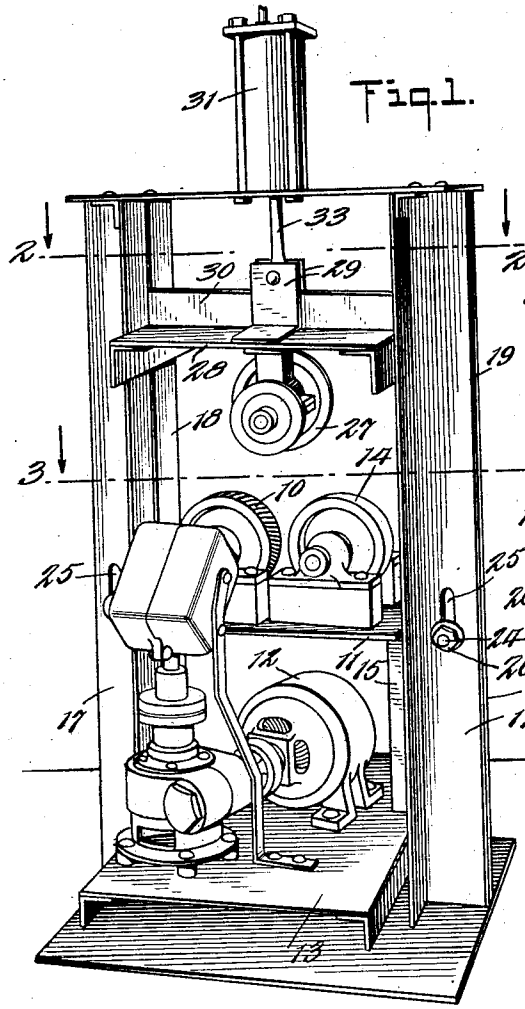


Fig. 1.

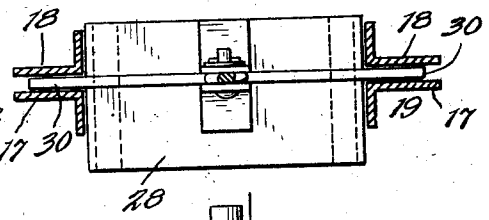


Fig. 2.

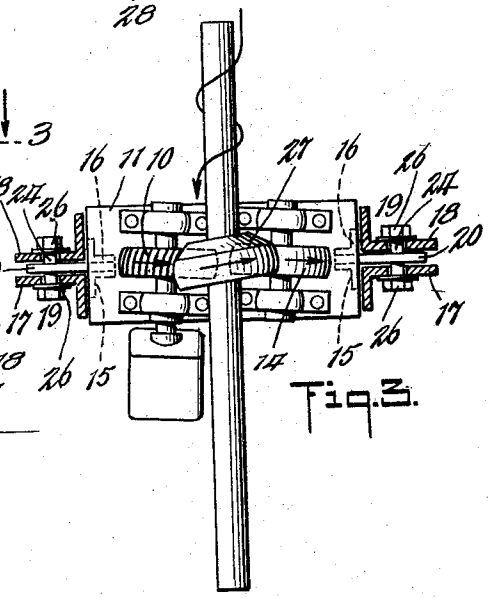


Fig. 3.

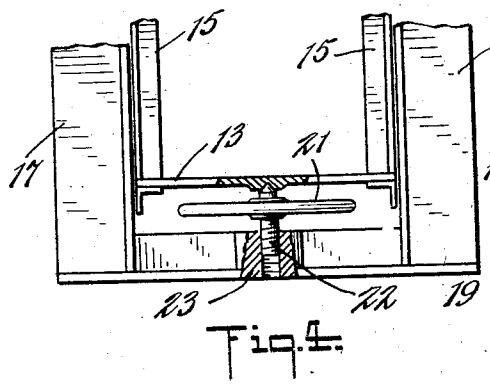


Fig. 4.

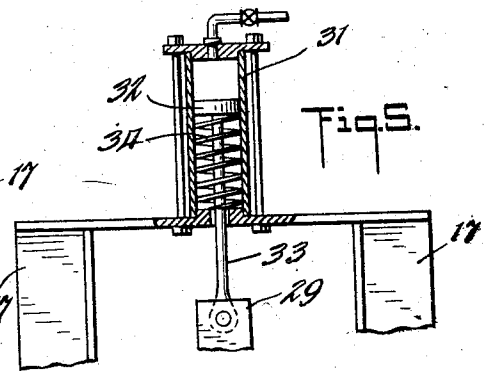


Fig. 5.

INVENTOR
DONALD S. SAMMIS
by his attorneys
Howson and Howson

Patented Nov. 8, 1932 1,887,434

UNITED STATES PATENT OFFICE

DONALD STUART SAMMIS, OF STRATFORD, CONNECTICUT, ASSIGNOR TO THE NEW HAVEN SAND BLAST COMPANY, OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT

TUBE ACTUATING MACHINE

Application filed November 18, 1929. Serial No. 408,067.

My invention relates to machines for rotating and advancing in the direction of its axis a cylindrical object, particularly a tube. More especially the invention relates to such machines which are generally used for simultaneously advancing and rotating a tube or round through an apparatus which affects its condition such as straightening rolls, or grinding, sand blasting, buffing and other similar machines.

One object of the invention is to provide an apparatus of the class described which will be easily adjustable with respect to the tube axis for different diameters of tube. Another object is to provide a motor-roller unit which is similarly adjustable. A further object is the provision of an additional adjustable roller. Other objects will appear later.

In the past, apparatus of the general character of the present invention has been designed, but adjustment of such apparatus has been unhandy or mechanically imperfect. I have now discovered that a very desirable form of apparatus may be provided by constructing a motor and a driven roller as an adjustable unit, and a second roller as a separately adjustable unit.

One form of the invention is shown by way of illustration in the accompanying drawing, wherein—

Figure 1 is a perspective view of the apparatus,

Fig. 2 is a section on the line 2—2 of Figure 1,

Fig. 3 is a section on the line 3—3 of Fig. 1,

Fig. 4 is a fragmental view of the bottom of the machine, certain parts being shown in section, and

Fig. 5 is a fragmental view of the top of the machine, certain parts being shown in section.

My invention comprises apparatus for revolving and advancing tubes, including an adjustable motor-roller unit, and a second roller unit which is also adjustable. Thus there is provided a motor-roller unit comprising a driving roller, a motor operatively associated with the driving roller, and means for adjusting the position of the roller and the motor together with respect to the axis of a tube upon which the apparatus acts. There may also be provided an idler roller and means for adjusting the position of the idler roller with respect to the tube.

Referring more particularly to the example illustrated, a driving roller 10 is mounted upon a shelf 11, and a motor 12 is mounted upon another shelf 13 beneath the first shelf, and is operatively associated with the driving roller. The driving roller is preferably scored as indicated to give more effective contact with the tube. An idler roller 14 may also be mounted on the shelf 11, with its axis parallel to that of the driving roller 10.

The axes of both rollers stand at an angle to that of the tube upon which they act, for a purpose which will be explained later.

The two shelves 11 and 13 are rigidly connected together, for instance by means of two pairs of angles 15, 16 attached to both shelves on opposite sides of the unit. These angles together with the shelves form a supporting structure for the driving roller and the motor. Adjacent the pairs of angles 15 and 16 on each side of the unit are a pair of slightly-separated angles 17, 18 forming the upright part of the apparatus frame 19. Between the parallel legs of each pair of angles 15, 16 there is fastened a plate 20 which extends into the space between the adjacent angles 17, 18 of the apparatus frame. Thus the plate 20 at each side of the shelves which is fastened between the angles 15, 16, will serve to guide the unit in the frame as the former is moved up and down.

The means for adjusting the position of the roller and the motor together,—that is to say: the motor-roller unit—may comprise a wheel 21 and threaded stem 22, the latter passing through and turning in a tapped bushing 23 in the lower part of the apparatus frame 19, but being keyed to the wheel 21 and projecting slightly above it. When the wheel is turned in one direction the threaded stem 22 will turn upwardly in the bushing 23. It will thereby elevate the wheel 21, the projection above the wheel, and the motor-roller unit whose base rests upon this projection. When the wheel 21 is turned in the

opposite direction, the stem 22 will descend in the bushing 23, and the unit of its own weight will descend with it, resting always upon the projection above the wheel. Thus the elevation of the driving roller 10 and the idler roller 14 carried by the unit may be adjusted for any diameter of pipe. Bolts 24 may be drifted through or otherwise attached to each of the plates 20 which slide in the frame 19 and vertical slots 25 may be provided in the angles 17, 18 through which these bolts project. Nuts 26 upon the bolts 24, when tightened, will fasten the unit in position upon the frame. There is thus provided means for fixing the driving roller in adjusted position.

Coacting with the unit just described, I may provide an idler roller 27 carried on the under side of a second shelf 28. The axis of the idler roller 27 is inclined to the axes of the other rollers, as is best illustrated in Fig. 3. It will thus be seen that the axis of any roller of one unit stands at an angle to the axis of any roller in the other unit. Furthermore it will be seen in the example illustrated in the drawings that the axis of any roller lies at an angle of less than 90° to that of the tube to be revolved and advanced. The second shelf 28 may be guided for vertical motion in the frame by means of angles 29 and a plate 30 in the same manner in which the first unit is guided. Thus a second supporting structure is provided for carrying the idler roller 27. In the upper part of the frame I may provide a cylinder 31 and in this cylinder a piston 32. A piston rod 33 projecting downward from the piston 32 may be connected with the second shelf 28, as by means of the angles 29, so that movement of the piston rod will move the shelf 28 and the idler roller 27 which it carries. A spiral spring 34 may be provided acting in compression between the lower part of the cylinder 31 and the under side of the piston 32. The strength of this spring 34 will preferably be sufficient to elevate the piston to the top of the cylinder with the weight of the shelf, guides, and idler roller attached to it. Thus the idler roller 27 may be elevated out of contact with a tube which is in position in the machine. The lower end of the cylinder 31 is preferably left open to atmosphere.

I may provide pneumatic means opposing the spring for moving the idler roller 27 into contact with a tube. Thus by applying pneumatic pressure to the top of the piston 32 the shelf 28 is depressed and with it the idler roller 27. Yieldable contact between the idler roller and the tube is thus established and maintained as long as desired. Release of the pneumatic pressure permits the spring 34 to withdraw the idler roller 27 from contact with the tube. The idler roller may thus be adjusted for any diameter of tube passing through the machine and its pressure upon the tube may be regulated by the pressure of the pneumatic fluid applied to the top of the piston. The cylinder, piston, and pneumatic means constitute means for yieldably holding the idler roller in adjusted position.

In operation a tube is projected into the space between the roller-motor unit and the idler roller and these two units are then adjusted to give the desired contact with the tube. To this end the wheel 21 will be rotated in the proper direction to bring the motor-roller unit into contact with the tube, and the pneumatic means described will be applied to bring the idler roller also into contact with the tube. The necessary adjustments will be made to give the desired pressure between the rollers and the tube, and the bolts 24, fastening the motor-roller unit in place, will then be tightened. When the motor is started the driving roller will rotate, thus rotating the tube.

Since the axes of all three rollers stand at an angle to that of the tube the path of each roller as the tube revolves will be that of a helix about the tube axis. Since the rollers are constrained however, from axial movement, they will apply an axial motion to the tube, which will not only be rotated but will also be advanced through the machine.

It will be obvious, of course, that variations in the construction here illustrated and described by way of example may be easily made, and will quite naturally occur to one skilled in the art. For instance, an idler roller need not necessarily be mounted on the platform with a driving roller, but may be positioned elsewhere. Also it is not necessary that pneumatic means be used to lower the platform and idler roller which have been described. Sill further, it is not necessary that the motor be mounted on a different shelf from that which supports the driving roller. My claims are, therefore, to be taken in the broadest sense consistent with the proper scope of the present invention.

I claim:—

1. In apparatus for revolving and advancing tubes, a driving roller having its axis at an angle of less than 90° to that of the tube to be revolved and advanced, a motor operatively associated with said driving roller, and means for simultaneously adjusting the positions of said roller and said motor with respect to the tube.

2. In apparatus for revolving and advancing tubes, an idler roller having its axis at an angle of less than 90° to that of the tube to be revolved and advanced, a spring for withdrawing said roller from contact with a tube, and pneumatic means opposing said spring for moving said roller into contact with a tube.

3. An apparatus for revolving and advancing a tube comprising a frame, a supporting

structure movable vertically in said frame, a driving roller carried by said supporting structure, a motor also carried by said supporting structure, means for adjusting the position of said supporting structure in said frame, and means for fixing said supporting structure in adjusted position on said frame, in combination with a second supporting structure movable vertically in said frame, an idler roller carried by said second supporting structure, and means for moving said second supporting structure in said frame to bring said idler roller into and out of contact with a tube.

4. Apparatus for revolving and advancing a tube comprising a frame, a supporting structure movable vertically in said frame, a driving roller carried by said supporting structure, a motor also carried by said supporting structure, means for adjusting the position of said supporting structure in said frame, and means for fixing said supporting structure in adjusted position on said frame, in combination with a second supporting structure movable vertically in said frame, an idler roller carried by said second supporting structure, pneumatic means for moving said second supporting structure in said frame to bring said idler roller into contact with a tube, and spring means for moving said second supporting structure and to bring said idler roller out of contact with the tube, substantially as described.

5. Apparatus for revolving and advancing tubes comprising a driving roller adjustable with respect to the tube axis, means for fixing said driving roller in adjusted position, an idler roller also adjustable with respect to the tube axis, and means for yieldably holding said idler roller in adjusted position.

6. Apparatus for revolving and advancing a cylindrical work piece comprising a plurality of roller units independently movable toward or away from the axis of the work piece, one of said roller units consisting of a driving roller and an idler roller having their positions fixed relatively to each other and the other of said units consisting of an idler roller whose axis stands at an angle to the axis of the rollers of the first unit.

In testimony whereof I have signed my name to this specification.

DONALD STUART SAMMIS.