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[54] **JET SAND BLASTING OF BENT TUBES OR RODS**

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[51] **Int. Cl.** **B24c 3/12;** B24c 3/32

[58] **Field of Search** ..... 51/14, 8 R, 290, 319–321

[56] **References Cited**

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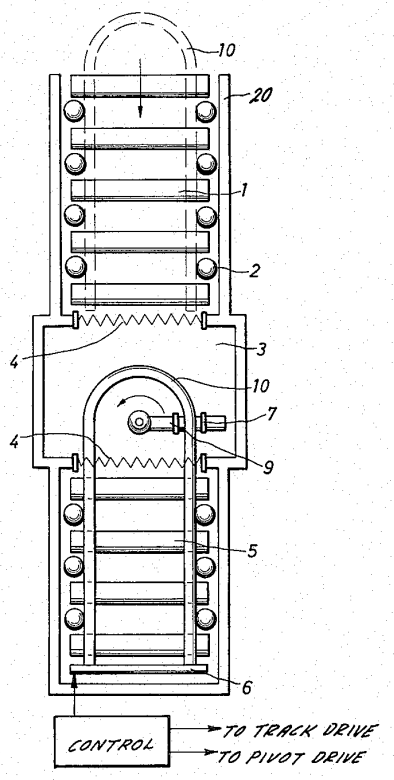
[57] **ABSTRACT**

U-shaped rods or tubes are sandblasted in that first one leg is passed through an annular duct having radially inwardly directed blasting nozzles; this duct is thereafter pivoted so that blasting follows the contour of the curved portion of such a rod or tube, and the other leg thereof is blasted upon retraction. The rod or tube is moved by means of roller tracks having lateral guide rollers to obtain exact positioning during sandblasting of the legs.

4 Claims, 2 Drawing Figures



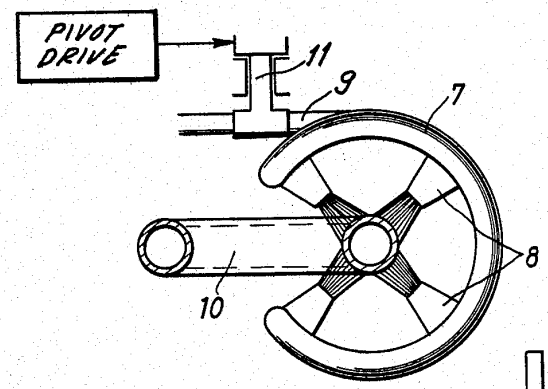
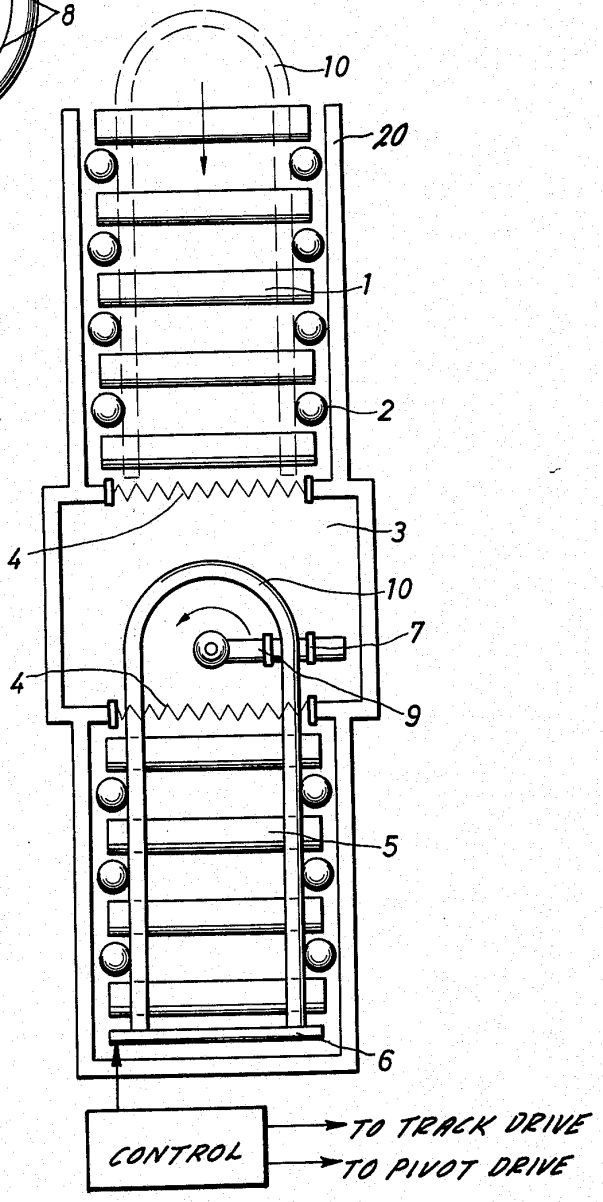


Fig.2

Fig.1



JET SAND BLASTING OF BENT TUBES OR RODS

BACKGROUND OF THE INVENTION

The present invention relates to sandblasting of tubes or rods bent in hairpin fashion, i.e., having U-shaped configuration.

Sandblasting straight tubes and rods is generally known and practiced with advantage. However, difficulties arise when the tubes are curved, and in the past the usual procedure was that the tubes were blasted when still straight, and they were bent subsequently. That method, however, resulted in changes in the surface texture of the tubes due to the bending, and the surface could no longer be treated adequately to obtain the desired degree of uniformity in surface texture.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an apparatus and device for providing blasting jets for uniformly and transitionless sandblasting curved and bent pipes, tubes or rods, particularly when even bent in hairpin fashion.

In accordance with the present invention, it is suggested to provide a blasting chamber with a pivotable annular duct and radially inwardly directed blasting nozzles; roller tracks run the tubes or rods to be sandblasted into the chamber, whereby one leg of such a tube or rod is guided through the annular duct followed by pivoting the latter on a vertical axis for blasting the curved portion of the tube or rod. The other leg of the tube or rod is blasted upon retraction of the tube or rod from the chamber by means of the nozzles of the same annulus. Alternatively, a second annulus with blasting nozzles treated this second leg in parallel with the first one.

The guiding of a rod or tube to be sandblasted is preferably carried out by vertically disposed rollers flanking the roller tracks. These guide rollers could engage the bent tube or pipe on the outside as to both legs, but guiding one leg from both sides may also be used.

DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention, it is believed that the invention, the objects and features of the invention and further objects, features and advantages thereof will be better understood from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a top view of the equipment in accordance with the preferred embodiment of the invention; and

FIG. 2 shows the pivotal blasting nozzle, on an enlarged scale, being part of the equipment shown in FIG. 1.

Proceeding now to the detailed description of the drawing, the illustrated equipment includes a roller track with horizontally arranged reversible rollers 1. The drive for these rollers is not illustrated and is conventional. The track is flanked on both sides by vertically arranged rollers 2 for guiding a hairpin bent or U-shaped tube 10 in a particular orientation on the roller track proper.

The sandblasting equipment is contained in a casing 3, defining the sandblasting chamber. This chamber has an entrance adjacent the end of the track with rollers 1 and an exit located opposite the entrance. Entrance

and exit of the blasting chamber are sealed to some extent by curtains 4 or the like to prevent escape of sand but permitting passage of the pipe.

The casing 3 contains a pivot arm 9 carrying a ring or annular duct 7 with a gap, and nozzles 8 project radially inwardly from duct 7. Respectively, two of the nozzles project in diagonally opposite disposition towards each other. Sand under pressure is fed, for example, through a journalled hollow shaft 11 from a suitable supply and pressure source and passes into the annular duct 7 for distribution to nozzles 8.

The pivot arm with annulus 7 and nozzles 8 is pivoted by means of a reversible drive, covering 180° for each pivot motion. However, for reasons of simplicity, the return motion for the pivot arm may not cover the same 180° in reverse motion, but may complete one turn as will be shown shortly.

The roller track 1 could also be termed the feeder track for the apparatus and blasting equipment. A second roller track 5 is provided on the other side of the blasting equipment. Adjacent to the exit of the blasting chamber in casing 3, track 5 could also be termed the control track. Lateral guide rollers are also provided here, and a stop 6 is provided at the end of that track 5. Upon engagement of the stop 6 by a tube contacts are actuated to control the roller tracks and other operations as will be explained shortly.

In operation a bent tube section 10 is placed onto roller track 1 in the illustrated position, i.e., with the legs extending towards the blasting chamber. The guide rollers 2 maintain that orientation. The pivot arm 9 holds the nozzle ring 7 to one side, and as the tube 10 enters the blasting chamber, one leg of the tube traverses the ring and is sandblasted as shown in FIG. 2.

As the tube 10 passes through the blasting chamber, the front ends of the two legs of U-shaped tube 10 will be engaged by the rollers 5 of the second track which cause the tube to moved until the front ends of the legs abut stop 6. The stop 6 has disposition so that now the curved portion of tube 10 is situated entirely in the blasting chamber whereby particularly the pivot axis of arm 9 traverses the center of curvature of the bent tube portion at the bottom of the U.

Upon abutment of the tube against stop 6, the roller tracks are stopped and the drive for pivot arm 9 is set into motion to turn the arm by 180°. Upon completion of that pivot motion, the pivot arm stops, and tracks 1 and 5 are again turned on, but in the reverse, and tube 10 is returned whereby now the other leg of the tube passes through the nozzle ring 7 until withdrawn from the chamber.

It can readily be seen that upon rapid action control and proportioning of the pivot and roller speeds, all portions of the tube can be made to pass through the nozzle ring at the same relative speed to obtain uniform blasting treatment throughout.

After the tube 10 so treated has been withdrawn, the pivot arm 9 may continue its pivot motion to complete a full turn, so as to assume the initial disposition of readiness for the next tube 10 to be sandblasted. Alternatively, the next tube 10 can be treated in the reverse order as to its legs, and the bent or curved portion can be sandblasted on the reverse pivot of annulus 7 on arm 9.

In the illustrated equipment a single nozzle ring is used to obtain the blasting treatment in a reversing process as far as the tube movement on the rollers is con-

cerned. Alternatively, one could use a second ring, which does not have to be pivotal, for blasting the second leg of the tube, and after the pivoting has been completed for blasting the curved portion, stop 6 is golded away and track 5 continues in the same direction to move the tube out of the blasting chamber and onto further conveying equipment. It can be seen that the gap in the nozzle ring or rings have to be provided for only in this case; an uninterrupted annulus can be used when the tube is reversed as was described first. Simply pivoting the annular duct 7 with nozzles 8 will suffice, if the curved or bent tube or rod portion follows a circular arc; the center of the annulus simply follows the bent axis of the tube during pivoting. However, the invention is also applicable to other contours of tube or rod curvature. In such cases one has to provide additionally for lateral displacement of the pivot. Also, additional roller track movement may aid in accurately following the contour of the curved tube portion.

The invention is not limited to the embodiments described above, but all changes and modifications thereof not constituting departures from the spirit and scope of the invention are intended to be included.

I claim:

1. Apparatus for sandblasting hairpin bent tubes or rods comprising:

a blasting chamber with aligned entrance and exit;

a first roller track disposed for moving such tubes or rods to and into the blasting chamber through the entrance;

a second roller track disposed for moving the tubes or rods from the blasting chamber when emerging from the exit;

an annular duct with radially inwardly directed blasting nozzles disposed in the blasting chamber so that one leg of a bent tube or rod, when moved into the chamber by the first roller track, traverses the annular duct for sandblasting through jets as ejected from the nozzles; and

means for pivotally mounting the annular duct for moving the annular duct with nozzles along the bent axis of the curved portion of the tube or rod for sandblasting the said curved portion.

2. Apparatus as in claim 1, wherein the rollers of the tracks are reversible for blasting the other leg upon reversal of the rollers of the tracks after pivoting of the annular duct, as the other leg passes through the annular duct during said reversal.

3. Apparatus as in claim 1, the roller tracks having lateral guides for providing for guided motion of the tube through the annular duct.

4. Apparatus as in claim 1 and including stop means for the legs of the tube rod to position the center of the curved portion in the pivot axis of the annular duct.

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