Sept. 3, 1929. C. A. DREISBACH 1,727,027

SAND BLAST DEVICE

Filed April 6, 1927

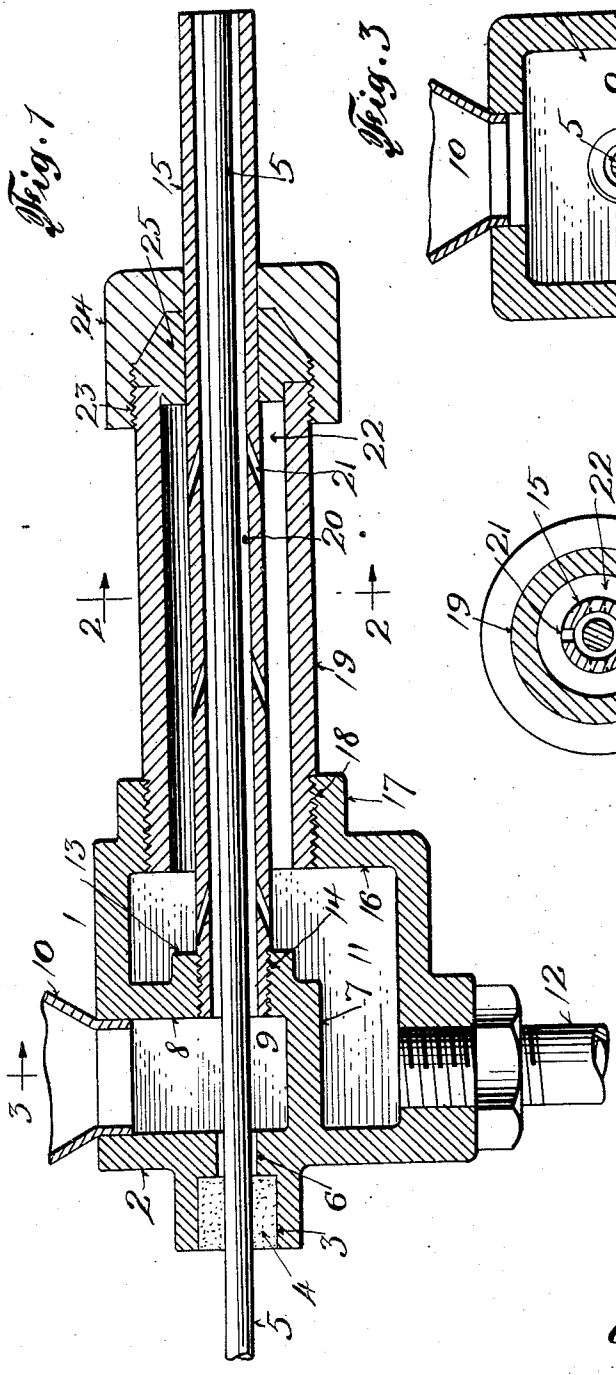


Fig. 1

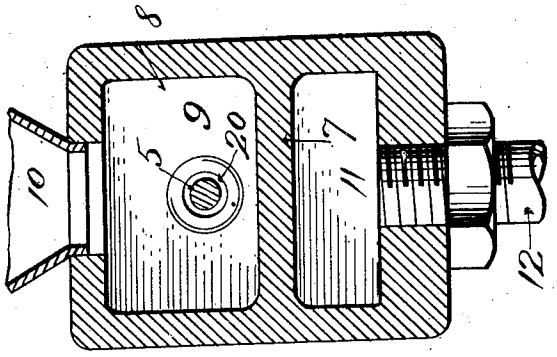


Fig. 3

Fig. 2.

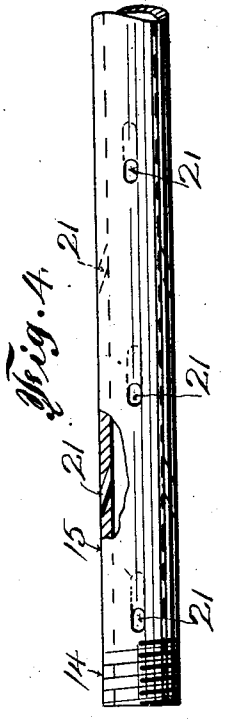


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SAND-BLAST DEVICE.

Application filed April 6, 1927. Serial No. 181,403.

My invention relates to a sand blast or scouring device for cleaning long strips, wires or rods, and the same is adapted to accomplish the same purpose as the device shown in the patent to Washburn, No. 1,400,585. In the present device a strip, bar or rod of material, usually metal, which is to be cleaned by a sand blast, is passed in a long or continuous length through the sand blast portion of the device so that a blast of sand and air at high velocity is projected against the surface of the member which is to be cleaned; and during the operation the wire, rod or other member passes continuously through the sand blast nozzle in order that the operation may be carried on continuously until it has been cleaned over its entire length.

One object of the present invention is to improve the construction and assembly of the sand blast nozzle and its associated parts in order that the parts may be made in the simplest and most economical manner, and in order that the parts may be assembled and disassembled quickly for the replacement of such parts as may become worn after extended use. With the present invention it is possible, with a simple and single nozzle, to subject an extended portion of the member under treatment to the action of the sand blast in such manner that the rod or wire may progress rapidly through the nozzle and at the same time be thoroughly cleaned throughout its entire surface.

In the drawing forming part of this application,

Figure 1 is a longitudinal sectional view through the middle of a sand blast device embodying my invention,

Figure 2 is a sectional view taken on the line 2—2 of Figure 1,

Figure 3 is a sectional view taken on the line 3—3 of Figure 1, and Figure 4 is an elevation of the perforated tube with a portion broken away.

The present device includes a frame or casing made principally in two assembled sections, one or both of which may be formed of cast metal if desired. One of these sections shown at 1 has a rear wall 2 provided with a rear socket or opening 3 to receive a soft or compressible packing 4 through which a strip of material 5 under treatment is adapted to pass, this packing serving to prevent backflow of the air and sand. The rear wall 2 of this casing member is provided with a central opening 6 extending in the direction of the length of the air blast device, and it is slightly larger than the diameter of the largest strip of material to be treated. There is formed within this casing member by means of the walls 7, 8 and the rear wall 2 a compartment 9 into which the sand is adapted to be fed by means of a hopper 10. While any type of hopper may be used for this purpose I prefer to use one corresponding with the hopper shown in said Washburn patent. The sand compartment 9 preferably extends below and surrounds the path of the rod 5 where it passes through the opening 6. The casing member 1 is also formed with an inner compartment 11 which serves as an air chamber and it is separated from the sand chamber by the walls 7 and 8. This air chamber preferably surrounds the path of the travelling rod 5 and the tubular nozzle hereinafter referred to. Compressed air is introduced into the chamber 11 by means of the hose or pipe 12 which is connected with any suitable source of supply such as an ordinary air compressor (not shown).

The wall 8 in the casing member 9 is provided with a tubular boss 13 having a central bore which is threaded to receive the threaded end 14 of the sand blast nozzle 15. The end wall 16 of the casing member 1 which defines one side of the air chamber 11 is provided with a boss 17 having a threaded bore 18 to receive a correspondingly threaded end of the outer member 19 of the blast nozzle. The inner member 15 of the blast nozzle is shown as tubular and it may be of uniform diameter throughout and its cross section may conform to the shape of the rod 5 which is under treatment; that is to say, if the rod 5 is circular in cross section as in the form illustrated in the drawing, then the nozzle member 15 may be circular in cross section, and its bore will be slightly larger than the rod 5 in order to provide an annular space 20 between the rod and the bore of the nozzle member 15 which annular space is in direct communication with the sand chamber 9. This nozzle member 15 is provided with a series of apertures 21 extending diagonally through its wall and these diagonal apertures may be arranged at various positions around the axis of the travelling rod 5, the number and size of the apertures being variable according to the conditions of operation. They may be cast at the time the member

15 is formed, or they may be afterwards drilled through the wall of this member. Between the periphery of this nozzle member 15 and the tubular casing member 19 there is an annular air space 22 which is in direct communication with the air chamber 11 at one end and the annular space extends along the nozzle member to a point beyond the farthest diagonal opening 21.

The outer end of the casing member 19 is threaded as shown at 23 to receive a packing nut 24 which has a central bore conforming to the outer diameter of the inner nozzle member 15; and this nut, when screwed into position, forces the packing 25 into tight fit between the inner surface of the member 19 and the outer surface of the nozzle member 15 as well as against the outer end of the member 19 so that there will be no leakage of air or sand from the annular space 22 except such as is directed through the diagonal apertures 21. The nut and packing also serve to retain the inner and outer nozzle members properly centered. The inner nozzle member 15 will extend some distance beyond the nut 24 in order that the sand will act on the surface of the rod 5 over a longer period.

In assembling the device the inner nozzle member 15 is screwed into the boss 13 after which the second casing member or outer nozzle member 19 is threaded into the boss 17, after which the nut 24 and the packing 25 are assembled into the position shown in Figure 1. The rod 5 to be treated is passed through the soft packing 4 through the bore 6, the sand chamber 9, and into the bore of the nozzle member 15. When the air blast admitted through the hose 12 is turned on and the rod is propelled through the device, the air from the chamber 11 passes in a series of jets through the dagonal openings 21 and is projected toward the periphery of the travelling rod 5. The air draws the sand from the compartment 9 through the annular space 20 and causes the sand to act frictionally on all portions of the rod 5 as both the rod and the sand travel through the bore of the nozzle member 15, the sand, of course, traveling at a much higher velocity than the surface of the rod. The sand is finally discharged from the outer end of the nozzle member 15 and it may be returned to the hopper in the manner shown in the said Washburn patent, if desired. It will be apparent that the sand is acting on the surface of the rod 5 from the time the rod enters the sand chamber 9 until it emerges from the nozzle member 15 and the action is more in the nature of a scouring action as it does not depend primarily on impact. With the present device the action of the sand is substantially uniform throughout all portions of the rod 5 which is the result most desired in a device of this character.

It will be obvious that the nozzle member 15, which is the part most likely to wear out, is very simple and inexpensive in construction and it may be very readily removed and replaced whenever it becomes worn to a degree requiring its replacement. There is substantially no wear on the outer nozzle member 19 because only air and not sand comes in contact with the inner surface of this member. In fact, the sand acts only upon the rod 5 and to a certain extent upon the interior of the nozzle member 15, so that wear upon the present apparatus is reduced to that caused by the friction of the sand against the inner surface of this nozzle member. This is an important feature because in most sand blast devices there is considerable wear within different portions of the device. The outer nozzle member in the present construction is of the simplest form and may be made of a pipe or tubing requiring only threading at each end. The construction of the device, therefore, has been reduced to the simplest form.

Having described my invention, what I claim is:

1. A sanding device adapted to operate upon a long strip of material passing therethrough, comprising a casing forming an air chamber and a sand chamber, a nozzle member through which said strip is adapted to travel, comprising a tubular member communicating at one end with said sand chamber, said nozzle member having apertures in its wall to permit the air from said air chamber to pass into the space between said travelling strip of the interior of said nozzle member.

2. A sanding device adapted to operate upon a long strip of material passing therethrough, comprising a casing forming a sand chamber and an air chamber following said sand chamber in the direction of travel of the strip of material, and a nozzle member through which said strip is adapted to travel and comprising a tubular member communicating with said sand chamber at one end and having apertures in its wall to permit air from said air chamber to pass into the space between said traveling strip and the interior of said nozzle member.

3. A sanding device adapted to operate upon a long strip of material passing therethrough, comprising a casing forming an air chamber and a sand chamber, a nozzle member through which said strip is adapted to travel, comprising a tubular member communicating at one end with said sand chamber, said nozzle member having apertures in its wall arranged at different points around the axis of said strip to permit air from said air chamber to pass into the space between said travelling strip and the interior of the nozzle member

4. A sanding device adapted to operate

upon a long strip of material passing therethrough, comprising a casing forming an air chamber and a sand chamber, a nozzle member through which said strip is adapted to travel, threaded into said casing, and having one end communicating with said sand chamber, said nozzle member extending through said air chamber and having apertures in its wall to permit the air to pass from said air chamber to the space between said travelling strip and the interior of said nozzle member.

5. A sanding device adapted to operate upon a long strip of material passing therethrough, comprising a casing forming an air chamber and a sand chamber, said casing having a plurality of threaded apertures of relatively different diameters, a nozzle member through which said strip passes, said nozzle member being threaded into one of said apertures, and communicating with said sand chamber to receive sand therefrom, an outer nozzle member surrounding said first nozzle member and threaded into the other of said threaded apertures to form an annular space between said nozzle members communicating with said air chamber, said inner nozzle member having apertures in its wall to permit the air to pass from said air chamber to the interior of said inner nozzle member and against said strip.

6. A sanding device adapted to operate upon a long strip of material passing therethrough, comprising a casing forming an air chamber and a sand chamber, said casing having a plurality of threaded apertures of relatively different diameters, a nozzle member through which said strip passes, said nozzle member being threaded into one of said apertures, and communicating with said sand chamber to receive sand therefrom, an outer nozzle member surrounding said first nozzle member and threaded into the other of said threaded apertures to form an annular space between said nozzle members communicating with said air chamber, said inner nozzle member having apertures in its wall to permit the air to pass from said annular space to the interior of said inner nozzle member and against said strip, and means for holding the free end of said outer nozzle member in spaced relation with said inner nozzle member and adapted to close the end of said annular space.

7. A sanding device adapted to operate upon a long strip of material passing therethrough comprising a casing through which said strip is adapted to travel, said casing having walls forming a sand chamber and an air chamber surrounding the path of said strip, with a dividing wall between said chambers having an aperture to receive a nozzle member, an inner nozzle member of tubular form through which the strip is adapted to pass, having one end mounted in said opening in said wall with its interior communicating with said sand chamber, an outer nozzle member surrounding said inner nozzle member and spaced therefrom to provide an air space communicating with said air chamber, said inner nozzle member having apertures distributed along its wall to permit air to pass from said air chamber to the interior of said inner nozzle member.

8. A sanding device adapted to operate upon a long strip of material passing therethrough, and comprising a casing forming an air chamber and a sand chamber, an inner nozzle member through which the strip passes and having one end communicating with said sand chamber, an outer nozzle member surrounding said inner nozzle member to form an annular space communicating with said air chamber, said inner nozzle member having apertures through its wall to permit the passage of air from said space to the interior of said inner nozzle member, a packing arranged adjacent the end of said outer nozzle member and closing the space between said nozzle members, and threaded means for holding said packing in place.

Signed at the city and county of New York, State of New York, the 25th day of March 1927.

CHARLES A. DREISBACH.