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[54] **DEVICE FOR SURFACE SANDBLASTING BY METAL GRIT OR THE LIKE**

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[52] **U.S. Cl.** ..... **51/9 R**

[51] **Int. Cl.** **B24c 7/00**

[58] **Field of Search** ..... 51/9 R, 8 R

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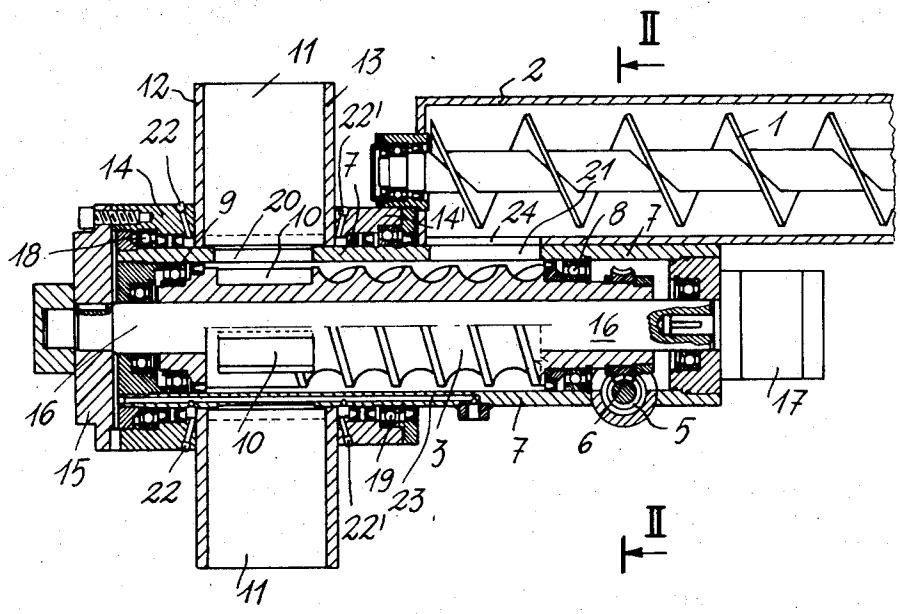
[57] **ABSTRACT**

A device for sandblasting inner surfaces of tubes by metal grit or the like is disclosed. The device comprises a tubular body and internally of said body a rotating distributor supplying the grit to a rotor projecting the grit against the surface to be processed.

8 Claims, 2 Drawing Figures



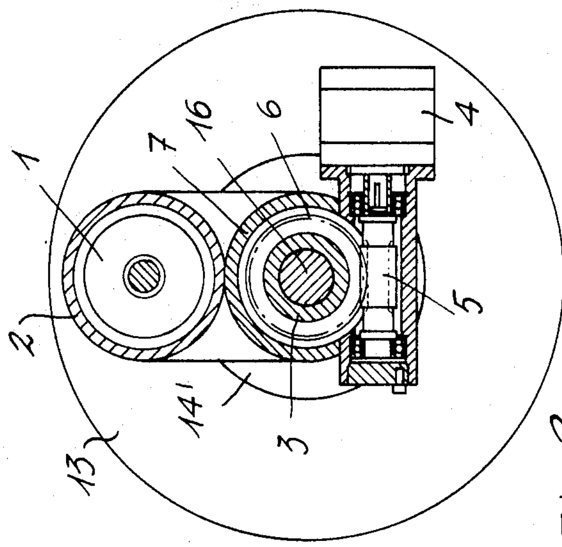


Fig. 2

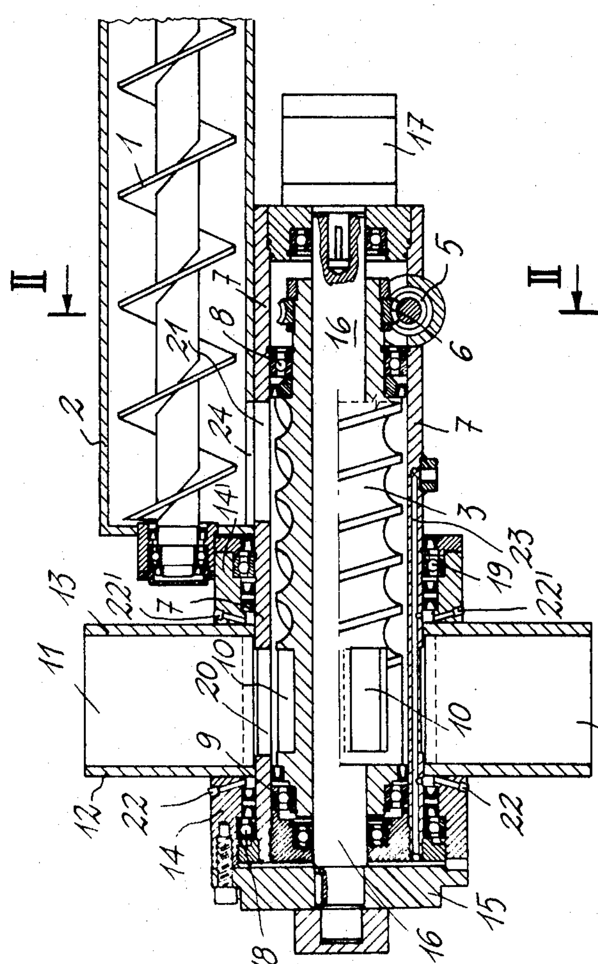


Fig. 1

DEVICE FOR SURFACE SANDBLASTING BY METAL GRIT OR THE LIKE

This invention relates to a device for sandblasting by metal grit or the like on surfaces that can be of various type and, for example, on inner surfaces of tubes or plates.

It is an object of the present invention to provide such a device, of a particularly simple and rational structure, lending itself to several applications, that is readily adaptable to various use requirements.

According to the present invention, a device for sandblasting by metal grit or the like is essentially characterized by comprising a tubular body, internally of which a rotating member or distributor is provided as operated by a corresponding motor, means for introducing the grit into said tubular body, and a rotor or impeller including blades to which said grit is supplied as projected by said distributor through openings or slits formed in said tubular body, a second motor being provided for driving said impeller, so that the speed of the latter can be adjusted independently of the speed of said distributing member.

For a better illustration of these and other features of the device according to the present invention, an exemplary embodiment of a device according to the present invention will now be described, reference being had to the accompanying diagrammatic drawing, in which:

FIG. **1** shows the device in a partly sectional view; and

FIG. **2** is a sectional view taken on line II—II of FIG. **1**.

As shown in the accompanying drawing, a device comprises an Archimediam screw, designated as a whole at **1** and rotatable on bearings within a tube **2.** This Archimedian screw **1** is driven by a suitable motor (for simplicity, now shown). A tubular body **7** is also provided, fixedly connected to said tube **2,** in which a member **3** is accomodated, this member **3** being substantially an Archimedian screw or the like, in the present specification referred to as a distributor.

The distributor **3** rotates within said body **7** on bearings **8** and **9.** For the drive of said distributor **3,** a suitable hydraulic motor **4** is provided (see FIG. **2**). More particularly, this hydraulic motor **4** drives the distributor **3** through a worm screw **5** and a worm wheel **6.** The tube **2** is provided with a hole **24,** and the tubular body **7** is also provided with a hole **21,** so that the grit can pass from the interior of tube **2** through said holes **24** and **21** to the interior of the tubular body **7.**

The distributor **3** is provided with a set of cavities **10,** in which the material (that is the metal grit) is supplied and then ejected by centrifugal force from tube **7,** as explained hereinafter.

An impeller (or turbine wheel) is also provided, comprising two disks **12** and **13,** respectively, and blades **11** fast said disks.

This impeller also includes a mounting comprising two support pieces **14** and **14'** connected to said disks **12** and **13.** Said impeller also comprises a flange **15** and a shaft **16** connected to said flange **15.**

Said mounting **14—14'** is rotatable on the tubular body **7** by means of bearings **18** and **19,** and said shaft **16** can rotate relative to distributor **3,** i.e., rotation of shaft **16** is independent of distributor **3.**

Therefore, the impeller substantially forms an integral unit, that is comprising said elements **11, 12, 13,**

14, 14', 15 and **16,** all of which are non-rotatably interconnected, and from the foregoing the rotation of the impeller is independent of the rotation of distributor **3.**

More particularly, the impeller shaft **16** is driven by a hydraulic motor **17.** Said flange **15** connects said shaft **16** to said mounting **14.** The tubular body **7** is crossed by slits (slots) **20** for the passage of the grit of the distributor **3** to the blades **11** of the impeller or turbine wheel above described.

The blades **11** are made of suitable particularly wear resistant material, such as manganese cast iron. In body **7** a hole **23** is provided and passed through by compressed air for ejecting any grit or powder depositing between elements **12** and **14,** as well as between elements **12** and **14'.** The ejection occurs through holes **22, 22'** provided in supports **14** and **14'.** This ejection avoids any seizure of the impeller or turbine wheel.

The operation of the above described device is substantially as follows.

The metal grit arrives through tube **2** as propelled by the Archimedian screw **1** and through slits **24** and **21** penetrates the interior of the tubular body **7.** As distributor **3** is rotating, the grit is carried to the impeller and thereby reaches the cavities **10.** The material i.e., the grit, arrives at said cavity **10** and by centrifugal force thrown onto the impeller blades **11** through slits **10.** In turn, said blades **11** throw the metal grit against the surface to be processed.

It is apparent that, for example, processing can be carried out on an inner surface of a tube, that is metal grit can be thrown in all directions through an angle of 360°.

This angle may vary according to the size and distribution of slits **20.**

From the foregoing, during operation, said Archimedian screw **1** is rotatably driven by a proper motor, distributor **3** is rotatably driven by said motor **4,** and the impeller is rotatably driven by motor **17.**

Therefore, it will be apparent that the speeds of the several rotating members can be adjusted so that, for example, speed of distributor **3** being unaltered, the impeller speed can be increased or reduced, and vice versa. For example, for a given speed of said Archimedian screw **1** and distributor **3,** a given amount of grit will exit in time unit. The speed at which the impeller or turbine wheel throws this grit against the surface to be processed can be varied within wide ranges, as desired. The blades **11** are interchangeable.

What I claim is:

1. A device for abrading the inner surfaces of tubes, comprising:

a first motor-driven screw;

a first tubular casing rotatably mounting said first screw;

a second motor-driven screw axially aligned with said first screw;

a second tubular casing having first and second ends and rotatably mounting said second screw; and

an impeller rotatably mounted axially of and adjacent said first end of said second casing for rotation independent of the rotation of said second screw;

said first casing having an opening adjacent one of its ends, the second end of said second casing being fixedly connected to said one end of said first casing in overlapping fashion, said second casing having an opening therein aligned with the opening in said first casing, said second screw adapted to ro-

tate at a different rotational velocity than said first screw;

whereby the rotational velocity of said first screw is effective to feed abrasive grit to the receiving end of said second screw through said openings, and whereby the rotational velocity of said second screw is effective to feed abrasive grit to the central area of said impeller which imparts substantial radial velocity to said grit by centrifugal force.

2. The device as claimed in claim **1,** wherein said first end of said second casing has slits formed therein through which grit is ejected into the central area of said impeller.

3. The device as claimed in claim **2,** wherein said second screw has a plurality of cavities adjacent its delivery end and axially aligned with said slits, said cavities serving to receive grit fed by said second screw prior to being ejected into said impeller through said slits.

4. The device as claimed in claim **1** including a screw drive-motor for said second screw and an impeller drive-motor, both motors being fixedly mounted adjacent said second end of said second casing.

5. The device as claimed in claim **4,** wherein said motors are hydraulic motors.

6. The device as claimed in claim **4,** wherein said impeller comprises:

two annular plates;

a plurality of radial blades inserted between said plates;

two supports for said plates and carried by said first end of said second casing through bearings;

a shaft coaxial with said second screw and rotatable independently of said second screw;

and a flange connecting one of said supports to said shaft, the latter being driven by said impeller motor.

7. The device as claimed in claim **4** including a worm screw on said screw drive-motor and a worm wheel keyed on said second screw, said worm screw and wheel providing driving power to said second screw.

8. The device as claimed in claim **7,** wherein a hole is provided in said second casing, and said device includes:

means for forcing air through said hole for ejecting any grit or powder depositing between said annular plates and said supports; and

holes provided in said supports, though which said grit or powder is ejected, so as to avoid any seizure of the impeller.

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