

THE APPLICATION OF PEENING BY WATER IN THE CLOSED VERTICAL VESSEL

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ABSTRACT

It is desirable to have this vertical container made by stainless Steel or protected against corrosion with high resistant coating. By two vertical pipes coming in vessel water with velocity 40–50 m/sec over two applicable jets. Blast of such water dropping water under pressure on the rotative wheel with its shaft. On this wheel can be fixed metallic items to be treated by water peening. On the top of Cover is placed some additional vent valve. On the Cover is placed one channel with axial fan to facilitate steam done going out by water drops shocking on the metallic items for peening. On this way made steam water going out and not increasing internal pressure. All remained water going – falling down in conical part of this vertical container. Jets with water arranged over peening items practical covering whole wheel in normal circulation driven by two conical gears connected with electric motor. It is very easy to assembly whole plant to put immediately in operation. It is destined for scientific research laboratory. Can be replaced from one area to other. It staying on the four spheric wheels rolls. Can be pushed and pulled on the area where is necessary. On the wall can be installed plastic glass window just for looking checking.

KEY WORDS

Vertical vessel, container wheel, jets, conic gears, shell, shafts, bearing, ventilation, valve, dropping water drainage, channel for steam water, surfaces, spheric wheels – rolls for replacement, installation, assembly, checking – controlling.

Application of Peening by water has some precedence in relation with others kinds of Shot peening, regarding more hygienic and healthy working area. Peening by water means that liquid mass blasting through pipe with high pressure and velocities falling on the metallic surface. These factors velocity and pressure are for discussion. This pipe with water connected with compressed air vessel to help such pump driving water from one place to pipes and final jets. Jets designed to catch necessary streaming of water in form falling drops on the metallic surface. We speaking about peening by water under certain speed. It is big question: how much is this velocity for betterment internal structures? It is necessary to know that structures after technological process in workshop: that some internal again have some residual tensions,

bending or stress. Surely that is not recommended to have such internal arrangement. These area with residual bendings, stresses, shears can cause after some time additional problem – propagation of some mini cracks. These phenomenon may have final catastrophic sequences. Normally by all our researchs and studies our desire is to avoid them. These are reasons is to say: we need to have velocity over jets blasting one size of 70 m/sec. It is not properly exact. It is necessary to know apart all other points: distance, angle of blast, covering area etc. as well material under dropping and how much is texture, where is effect of this outside grooving – shocking. Therefore in some cases velocities are 70-80 m/sec, and particularly in some is over 100 m/sec. Mainly speaking about this problem peening – blasting must properly selected to avoid any destruction and deformation of object.

DESCRIPTION OF CONSTRUCTION

Whole device contents of three sections as is shown on the picture Fig. 1 as Machine for peening by water: 1 Bottom conical section as part of vessel with items 9 – shell, 17 valve for coming – falling water after process, 18 conical part for collection used water in process of peening. 13 item presents four bowl wheels for pulling – pushing of all construction on desired place in workshop or laboratory. This bottom section of vessel is connected by one round steel flange with mean section with bolts and gaskets. This mean section is main part where is mechanism for rotative motion of small round platform for which are fixed items to be treated by water peening. Pipes items 6 and 7 are fixed on one place water coming with necessary velocity covering whole round area during rotation. All this is fixed with vertical shaft and two bearings item 10. By conical gears item 8 is moving over small axles fixed with two flanges item 11. Top section connected with mean part and two round flanges. Top sections is one conical cover item 2 with fan item 3 for discharging going up water steam as making by water shocking on surface of metallic items. One view “A” on the complete device is possible more detailed to see and check how is function of this device. On the fig 2 is view “A” with item 5 rotative platform with these distances C and D what covering whole round surface with water blasting by item 6 and 7. Round rotative plate is forced with diameter of “e” serving for quickly removing water after falling on treated items. Horizontal shaft with flanges attached has two bearings item 12. Outside are two gears 14 and 15 what connected directly with electric motors. On the Fig. 3 what is view B-B from the Fig 1 is possible to see on the Fig 3. Connection gears 14 and 15 through vessel shell is possible to see such joint with two flanges with shaft fixed with normal bolts made of material corrosion resisting steel or stainless steel. This connection is little reinforces by additional part of ss plates to avoid any damage by hole for pipe.

CONCLUSION:

This device for vessel peening by water is one principle solution. It size can dependently of items to be treated for peening. Can have fixed place in one manufacturing area, as well can be made small size to be removed from one to other place in workshop or laboratory for testing. Finally speaking this device can be with minimal device staying in laboratory table with small weight transferable by hands from one to desirable place.

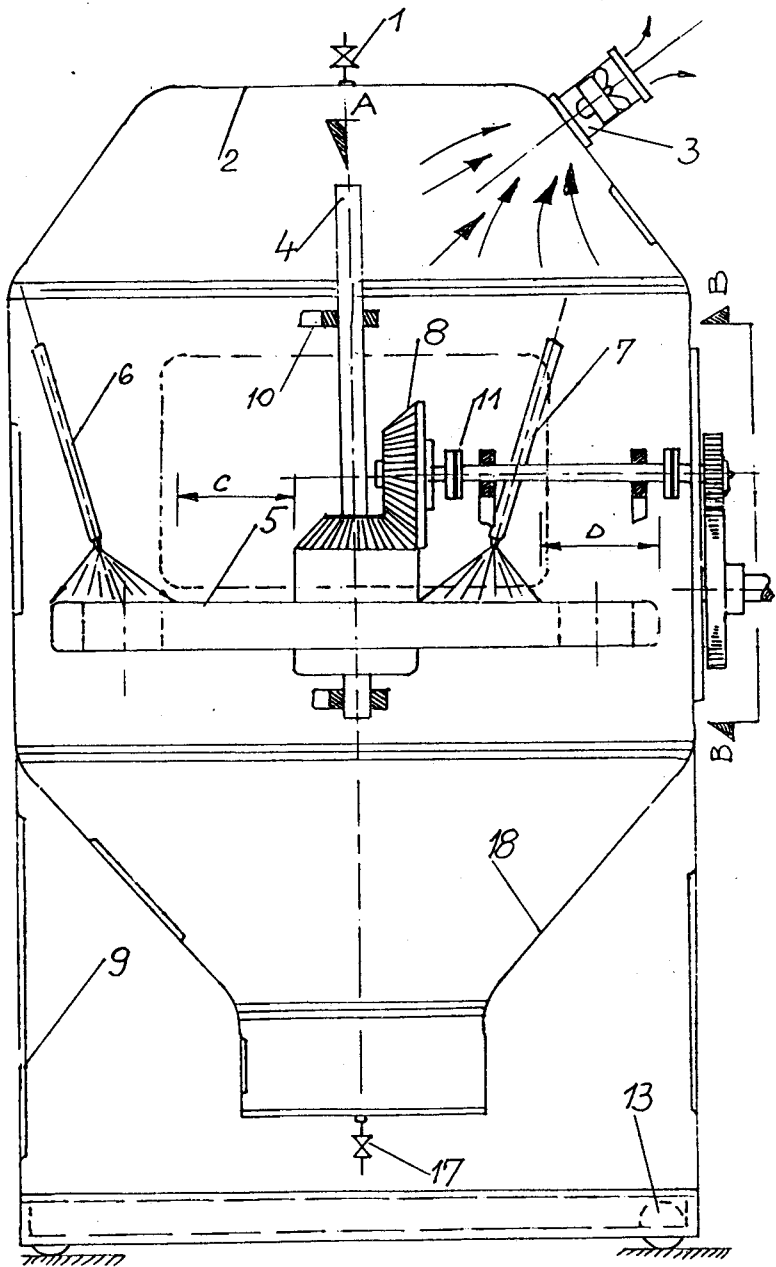
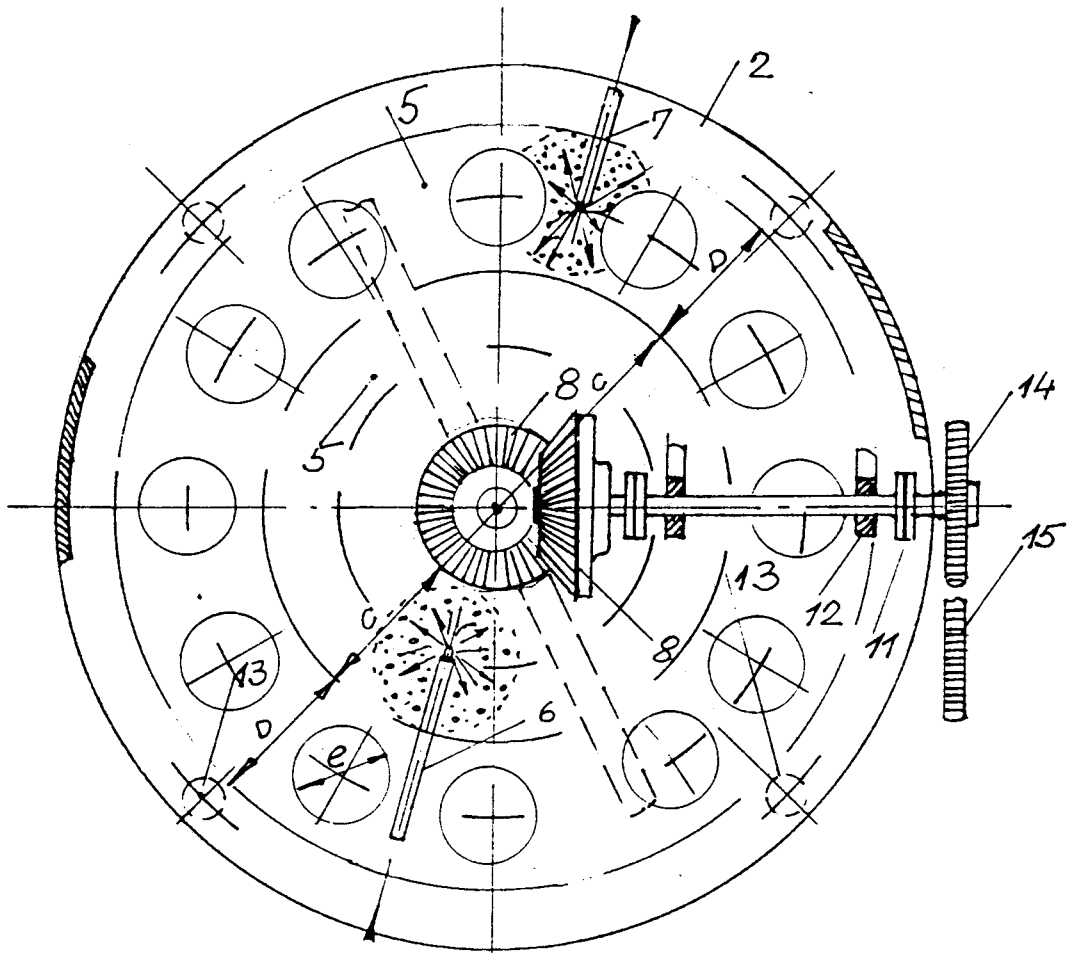


Fig. 1. Machine for peening by water



LIST OF INDICATED ITEMS ON THE SKETCHES

- | | |
|----------------------------------|---------------------------------------|
| <i>1 VALVE FOR AIR</i> | <i>13 SPHERIC ROLL FOR MOVING</i> |
| <i>2 UPPER COVER OF HOUSING</i> | <i>14 MAIN GEAR FOR ROTATION</i> |
| <i>3 DISCHARGING STEAM</i> | <i>15 MAIN GEAR</i> |
| <i>4 MAIN SHAFT FOR ROTATION</i> | <i>16 SQUAR STEEL FOR TIGHTING</i> |
| <i>5 HORIZONTAL WHEEL</i> | <i>17 DISCHARGING VALVE FOR WATER</i> |
| <i>6 PIPE FOR BLASTING</i> | <i>18 BOTTOM CONICAL SHELL</i> |
| <i>7 PIPE FOR BLASTING</i> | <i>19 BOLTS FOR TIGHTING</i> |
| <i>8 GEAR FOR ROTATION</i> | <i>20 VESSEL SHELL</i> |
| <i>9 BOTTOM SHELL</i> | |
| <i>10 BEARING</i> | |
| <i>11 SHAFT WITH FLANGES</i> | |
| <i>12 BEARING</i> | |

Fig. 2. View „A” machine for peening by water

DETAIL OF CONNECTION WITH SHELL
OF VESSEL FOR DRIVING PARTS

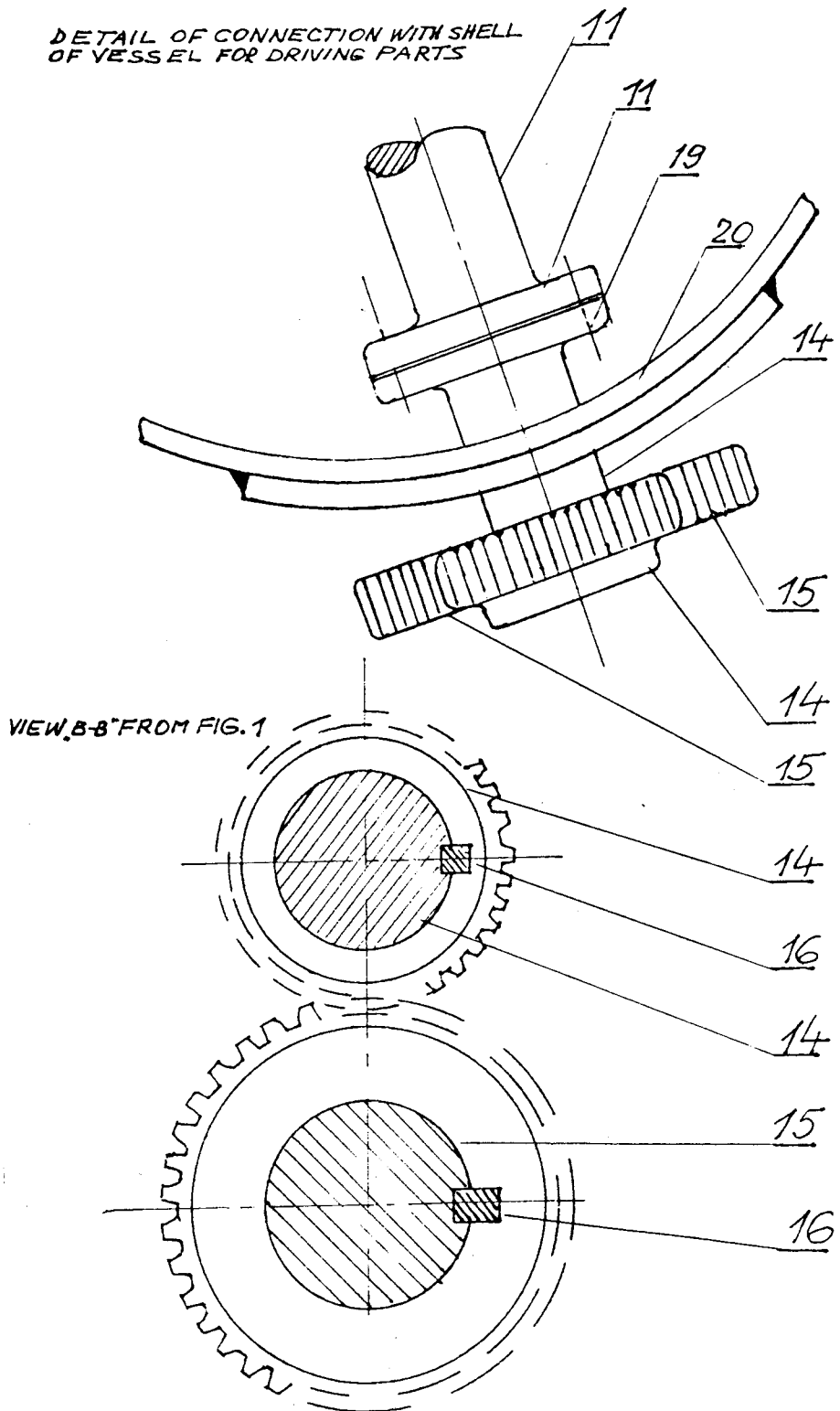


Fig. 3. View B-B machine for peening by water