Dec. 15, 1964 C. H. BRADLEY 3,160,991

WORK PIECE PASSAGE SEALS FOR SHOT BLASTING APPARATUS

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Fig. 1.

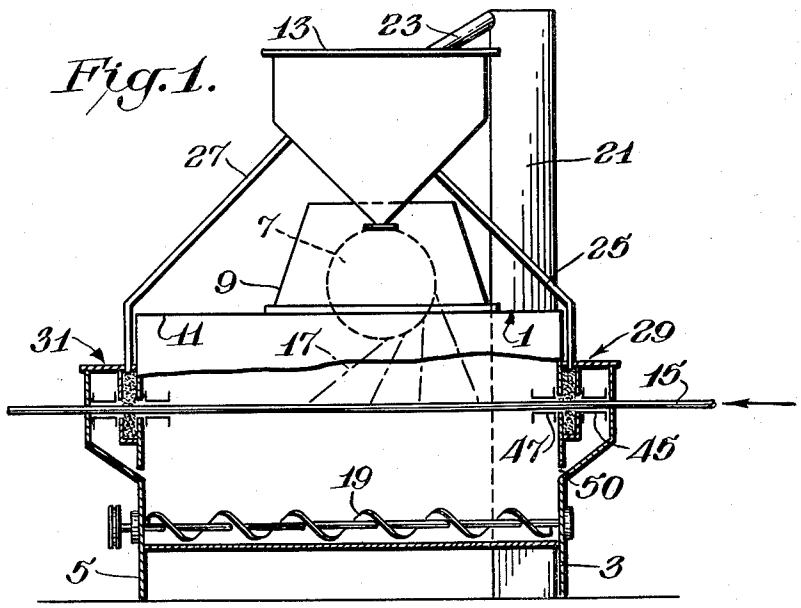
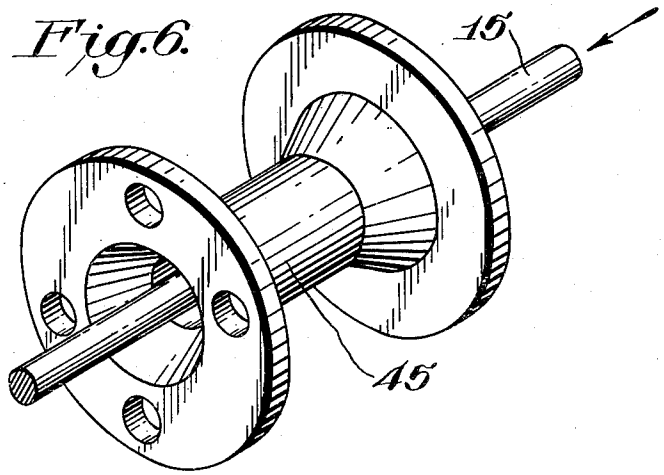


Fig. 6.



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Fig. 5.

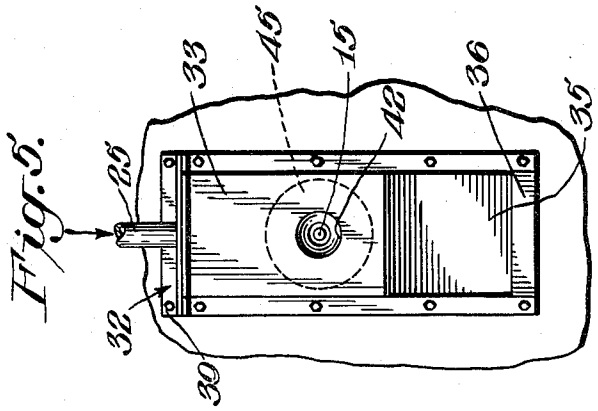


Fig. 2.

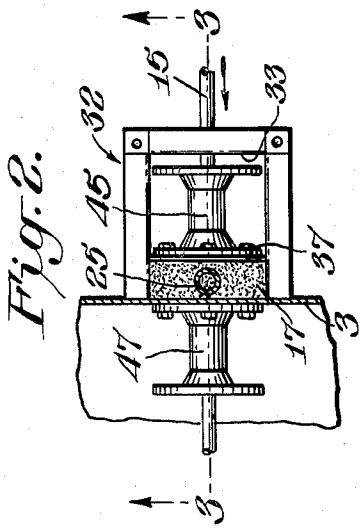


Fig. 3.

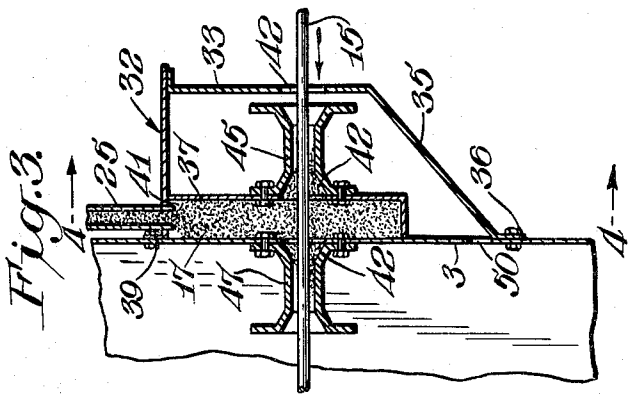
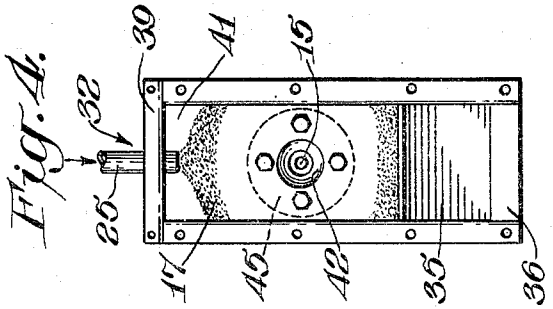


Fig. 4.



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WORK PIECE PASSAGE SEALS FOR SHOT BLASTING APPARATUS

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The invention relates to shot blasting apparatus used for abrading, peening, polishing, cleaning, descaling and surface hardening elongated work pieces, such as rods and bars, etc. In particular, the invention relates to improved means for sealing the work piece entrance and discharge passageways of the blasting cabinet through which passageways elongated work pieces, such as rods, bars, etc. are passed.

Air and airless abrasive blasting techniques which are in use for the above operations require the use of effectively sealed cabinets or enclosures which house the blasting operation to protect attending personnel from being hit with abrasive escaping through the passageways. Good seals are also important to prevent loss of the shot blast.

The sealing of the exit and entrance for the work pieces has presented a problem heretofore. Previously developed sealing means, such as gaskets of rubber or other materials, labyrinth baffles, all have serious shortcomings. The problem is especially difficult when using relatively high specific gravity ferrous particle blasting media of minute size. Seals known heretofore have been defective in that they do not provide a good sealing effect and tend to deteriorate in use under the impact and abrasion effects of the blastant being propelled thereagainst.

A primary object of the invention is to provide new and novel means for sealing work piece passageways for elongated work pieces in shot blasting cabinets for blast abrading operations to prevent escape of the blasting media through the passageways.

Another object of the invention is to provide improved sealing means which acts as a sealing curtain and which is free of wear or other deterioration and thus requires little or no maintenance.

Still another object of the invention is to provide improved sealing means of the above objects which facilitates insertion and withdrawal therethrough of work pieces of various dimensions and shapes without effecting the quality of the seal.

Other objects and advantages of the invention will become apparent from a study of the following description and drawings wherein:

FIGURE 1 is a longitudinal section of the shot blasting apparatus;

FIGURE 2 is a top view of the sealing means shown in FIGURE 3;

FIGURE 3 is a vertical section of the work piece passageway sealing assembly taken along line 3—3 of FIGURE 2;

FIGURE 4 is a section taken along line 4—4 of FIGURE 3;

FIGURE 5 is a view taken from the right side of FIGURE 3; and

FIGURE 6 is a perspective on an enlarged scale of a work piece guide used in the present invention.

Referring now to FIGURE 1 of the drawing, there is shown an abrasive blasting apparatus which includes the housing 1 having side walls 3 and 5. A shot blast propelling wheel 7 is rotatably supported in a wheel housing 9 which is open at the bottom whereby the wheel 7 extends partially into the blasting cabinet 1 through an opening in the top wall 11 of the blasting cabinet to permit the abrasive to pass into the cabinet 1. Abrasive shot is fed to the wheel from a storage container 13 supported above the housing 9 for the blasting wheel 7. The work piece which is shown as a rod 15 in FIGURE 1 travels through the side walls 3 and 5 of the cabinet and is subjected to the abrading action of the shot 17 being propelled from the wheel 7 as shown in FIGURE 1. As mentioned above, the impact of the shot against the rod or other work piece 15 cleans or otherwise treats the rod as mentioned above. The used shot is collected at the bottom of the cabinet 1 and is carried by a screw conveyor 19 to an elevator 21 to be raised to flow through the feed spout 23 which discharges into the storage bin 13. Suitable air separators may be installed subsequent to the elevator or between the elevator 21 and the feed spout 23 to remove fines and other contamination therefrom before it is conveyed into the storage bin.

As also seen in FIGURE 1, abrasive feed spouts 25 and 27 lead off at an angle from the bottom of the storage bin 13 on each side thereof. These spouts 25 and 27 lead downwardly to the abrasive seal means generally identified as 29 and 31 on each side of the abrasive treating cabinet and which cover the entrance and discharge passageways for the work piece 15.

The seal means 29 and 31 will now be described more specifically by reference to FIGURES 2–6 of the drawing. As seen in FIGURE 3, a box-like unit 32 is attached to the side wall 3. As shown, for example, in FIGURE 3, this hollow enclosure or unit 32 includes means (later described) for confining the abrasive shot 17 which is sealed around the work piece 15. A similar unit will also be attached to the cabinet side wall 5 on the opposite side. The abrasive feed spout 25 which feeds the abrasive to the seal is shown as extending through the top of the box-like unit 32. However, the spout 25 can extend through a side wall of the box near the top thereof. The box-like unit 32 has an outside panel 33. The panel 33 tapers inwardly at an angle at the lower portion thereof to provide an abrasive slide 35. The lower end thereof takes the form of a foot 36 which lies flush with the cabinet walls and which is affixed to the side wall 3 of the cabinet.

As seen better in FIGURES 2 and 3, the box-like unit has an inner wall 37 opposite to 33 which extends from the top of the box-like unit downwardly and terminates at a point spaced above the inwardly extending or tapering portion slide 35 of the opposite end wall 33. As seen in FIGURE 3, the lower end of the inner wall 37 bends inwardly to lie contiguous with the side wall 3 of the abrasive treating cabinet 1. That portion of the top of the box-like unit 31 which extends inwardly beyond the partial inner wall 37 bends upwardly at a right angle at its terminal end to form a foot 39 which lies flush against the side wall 3 of the abrasive treating cabinet and is secured thereto.

With the above arrangement, an inner compartment 41 is formed immediately adjacent and externally of the side wall 3 of the abrasive treating cabinet 1. Abrasive shot 17 is fed into this compartment 41 through the spout 25 connected with the abrasive storage bin 13.

The inner partial wall 37, the side wall 3 of the abrasive treating chamber and the outer panel 33 all have circular shaped work piece openings or apertures 42 therein. The innermost ends of a pair of hollow spools 45 and 47 (see FIGURE 6 also) abut and extend over these openings in the walls 37 and 3 being secured thereto as shown in FIGURE 3. The outer end of spool 45 is spaced from the outer panel 33 for reasons which will be explained.

With the above arrangement, abrasive 17 will pass from the bin 13 through spout 25 and into the seal compartment 41. Some abrasive also passes through the circular openings 42 in walls 37 and 3 and into the conical

end portions of the spools 45, 47 to provide a complete and thorough seal for the work piece passageways by which the work piece 15 enters and leaves the abrasive treating chamber 1.

Some of the abrasive may flow along with the moving rod 15 as it enters or leaves the abrasive treating chamber 1. If it flows through the spool 45, it will drop downwardly onto tapered wall slide 35 of panel 33 and through opening 50 in the cabinet wall 3 into the bottom of the abrasive treating chamber 1 where it will be recirculated to the abrasive storage bin 13. If it flows along with the work piece 15 through spool 47 it will fall directly to the bottom of the abrasive treating compartment 1 to be recirculated as described above. Any abrasive which is so displaced is replenished by abrasive from the spouts 25 or 27 to maintain the compartments 41 full.

The hollow spools may have different shaped channels to correspond with work pieces of different shaped cross section. This also applies to the apertures 42 in the walls 33, 37 and 3.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. An abrasive blasting apparatus comprising a blasting cabinet, a rotary blasting wheel extending into the cabinet, an abrasive storage bin connected with said wheel for feeding abrasive to said wheel, a work piece entrance through one side of the cabinet, a work piece exit through the opposite side of the cabinet, a hollow enclosure over said entrance, a hollow enclosure over said exit, a work piece opening in said enclosure, means leading from said bin to each enclosure to feed abrasive therein to maintain the same filled with abrasive, and said hollow enclosures including abrasive confining means for sealing said abrasive around said work piece.

2. The apparatus according to claim 1 wherein each enclosure consists of a box-like unit having an outer panel, a work piece entrance in said panel, an inner wall, and a top which extends beyond said inner wall and is secured to the side wall of said cabinet, said inner wall having its lower end extending inwardly and lying in contact with said side wall of said abrasive cabinet, said top extension, said inner wall, and said inwardly extending

lower end of said inner wall forming with said side wall of said abrasive cabinet an abrasive compartment, and a work piece passageway in said inner wall, said abrasive feed means extending into said compartment whereby said compartment comprises said abrasive confining means.

3. An abrasive blasting apparatus comprising a blasting cabinet, a rotary blasting wheel extending in the cabinet, an abrasive storage bin connected with said wheel for feeding abrasive to said wheel, a work piece entrance through one side of the cabinet, a work piece exit through the opposite side of the cabinet, an enclosure over said entrance, an enclosure over said exit, a work piece opening in each enclosure means leading from said bin to each enclosure to feed abrasive therein to maintain the same filled with abrasive, each enclosure consisting of a box-like unit having an outer panel, a work piece entrance in said panel, an inner wall, and a top which extends beyond said inner wall and is secured to the side wall of said cabinet, said inner wall having its lower end extending inwardly and lying in contact with said side wall of said abrasive cabinet, said top extension, said inner wall, and said inwardly extending lower end of said inner wall forming with side wall of said abrasive cabinet an abrasive compartment, a work piece passageway in said inner wall, said abrasive feed means extending in said compartment, a spool being secured over said work piece passageway on the outer side of said inner wall, and a mating spool is secured to the inner side of said wall of said abrasive cabinet over said work piece passageway, said hollow portions of said spools serving as work piece passageways.

4. The apparatus according to claim 3 wherein the outer panel tapers inwardly at its lower end to lie a spaced distance below said lower end of inner wall and to contact said side wall of said abrasive treating cabinet, and an opening is present in said side wall of said cabinet adjacent said point of contact of the lower end of said outer panel with said cabinet side wall.

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