April 21, 1936. W. F. STOODY 2,038,249

SANDBLAST NOZZLE AND HOLDER

Filed May 17, 1933

Fig. 1.

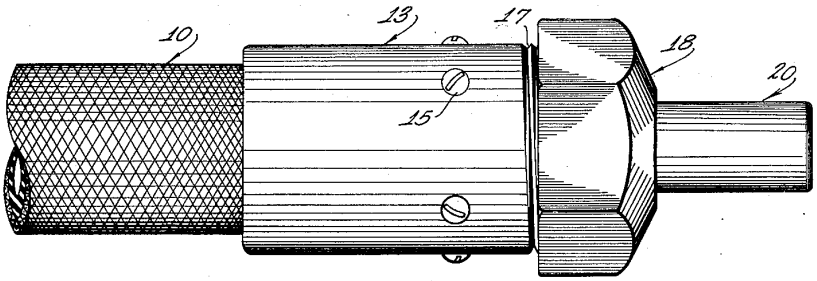


Fig. 2.

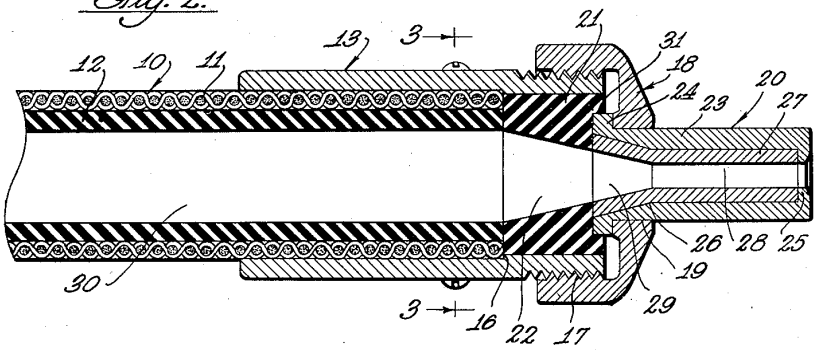
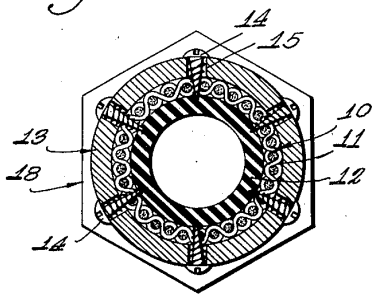


Fig. 3.



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SANDBLAST NOZZLE AND HOLDER

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8 Claims. (Cl. 51—11)

This invention relates to improvements in sand blast nozzles and holders therefor. Heretofore sand blast nozzles and holders intended to be used in conjunction therewith have been designed, most of which have internal shoulders of one form or another in the line of flow of air and sand. These internal shoulders not only form obstructions in the line of the air blast, reducing the effectiveness of the sand blast, but are subject to the wear of the sand with the result that parts must be replaced from time to time. Where these internal shoulders are formed of metal, the ability of the sand to cut these metal shoulders is increased requiring frequent replacements of these parts.

An object of the present invention is to provide an improved sand blast nozzle holder of such a design that there are no internal shoulders in the line of flow which would otherwise retard the flow of sand and be subject to its cutting action.

Another object of the invention is to provide a sand blast nozzle holder of simple and durable design which is so constructed as to facilitate replacement of any parts which may be subject to wear.

A further object of the invention is to provide a construction wherein some provision is made for centering the nozzle with respect to the hose and with respect to the intervening washer disposed between the nozzle and hose.

A further object of the invention is to provide a novel construction of nozzle.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, and specifically pointed out in the appended claims, reference is had to the accompanying drawing for an illustrative embodiment of the invention, wherein:

Fig. 1 is a view in side elevation of the improved sand blast nozzle and holder therefor.

Fig. 2 is a vertical section through the same.

Fig. 3 is a section taken substantially upon the line 3—3 upon Figure 2.

Referring to the accompanying drawing, wherein similar reference characters designate similar parts throughout, the improved sand blast nozzle and holder are applied to the conventional sand blast hose generally designated by the reference character 10. The conventional hose used for this purpose consists of an outer fabric layer 11 impregnated with rubber. On the interior of this outer layer there is a heavy layer 12 of soft live resilient rubber. This interior coating, or layer of rubber, is utilized on the interior of the hose because it is well known that soft live rubber is capable of withstanding the wear of the air and sand forced therethrough.

The holder for the nozzle comprises a cylindrical body 13 of such internal diameter that it may be slipped onto the end of the hose 10. It will be noted that this body is positioned on the outside of the hose so that it will not form any shoulders on its interior as distinguished from some prior sand blast nozzle holder designs wherein the body is inserted in the hose with the result that an internal shoulder is formed. This body may be secured to the hose in any suitable manner, the construction illustrated for this purpose being merely a series of screws 14 which are driven through apertures 15 in the body into the walls of the hose. On the interior of the body there may be a very small shoulder 16 against which the end of the hose may abut. The forward end of the body is externally threaded as indicated at 17 to receive a metal bonnet 18 having a central aperture 19 formed therein. This aperture receives the nozzle generally designated at 20. Between the nozzle 20 and the end of the hose there is positioned a soft live resilient rubber washer 21. This washer fits snugly within the threaded end of body 13. The passage 22 therethrough tapers forwardly so that the rear end of the passage in washer 21 has a diameter substantially equal to the internal diameter of hose 10.

The nozzle 20 consists of a body 23 having an external flange 24 at its rear end and an internal flange 25 at its forward end. This body may be formed of relatively soft steel. At the rear end of the body it is coned or flared out as indicated at 26. On the inside of this body, there is provided a liner indicated at 27 which is preferably formed of hard metal. I find that a metal suitable for this purpose consists principally of tungsten carbide. The liner is produced by casting the tungsten carbide into the shape shown wherein the major portion of the liner is cylindrical and its rear end is conical to fit the coned out portion 26 of the body. The passage 28 through the liner has its rear end flared as indicated at 29. The liner 27 and the body 23 of the nozzle are preferably assembled by merely inserting the liner in the body from the rear end of the body 23 and sweating it in place against internal shoulder 25. The forward end of passage 22 in washer 21 has a diameter substantially equal to the diameter of the rear end of passage 29 and in this way it will be noted that the size of passage 30 in the hose is reduced by means of washer 21 and the flared portion 29 of the liner down to

the size of passage 28 without the formation of any sharp shoulders in the path of flow with the result that the air blast carrying the sand may freely enter the small passage 28 without being subject to retardation nor with any opportunity present for the cutting away of any sharp shoulders. This results in the discharge of a strong sand blast from the nozzle having a maximum efficiency. It will be noted that the forward face of washer 21 has a circular recess 31 formed therein which partially receives the flange 24 on the nozzle body 23.

The operation and advantages of the improved sand blast nozzle and holder are as follows. The hard metal liner 27 in the nozzle is sufficiently hard to effectively resist wear of the issuing blast of sand and the problem has been to design a construction wherein the air blast together with the sand can be directed from the enlarged passage 30 in the hose into the small nozzle without involving the presence of sharp shoulders. The washer 21 effectively forms a reducer, causing this contraction of the stream and inasmuch as this washer is formed of live rubber the small amount of wear on the interior of the washer is effectively withstood by the resilient rubber surface on the interior of the washer. An important advantage of the construction also resides in the fact that the bonnet 18 tightens the nozzle against this washer, which is of considerable thickness, compressing the washer to a certain extent and thus effectively preventing any leakage around the rear end of the nozzle. If the washer is compressed considerably, the forward end of the washer will be crowded inwardly so as to be contracted smaller than the rear end of portion 29 of the liner. In such an event although there will be a small shoulder in the path of flow, the shoulder will be directed toward the forward end of the nozzle rather than toward the hose so that it will not retard the flow of the stream therethrough. It will be noted that the improved construction accurately centers nozzle 20 with respect to the center of passage 30 in the hose and as the flange 24 on the nozzle is partially recessed in the forward face of the washer the nozzle and washer will be effectively centered with respect to each other. When it is necessary to replace the nozzle or to replace washer 21, bonnet 18 may be unscrewed enabling the nozzle to be pushed rearwardly therethrough. If washer 21 in the course of time has become worn, it may be easily replaced while the bonnet is thus removed. In applying the bonnet and nozzle it will be noted that the nozzle is not tightened against a rigid metal surface but instead is tightened against a resilient compressible rubber washer 21 so that it is always an easy matter to unscrew the bonnet when replacement of the nozzle or washer is required. Inasmuch as these nozzles and nozzle holders are frequently thrown down, it will be noted that the presence of the large body of resilient rubber behind the nozzle acts somewhat as a cushion for the nozzle reducing breakage.

While the invention has been described as being embodied in a sand blast nozzle, it will be appreciated that it is not restricted thereto. The invention may be incorporated in a nozzle of a cement gun, or any equivalent construction wherein the stream discharged contains abrasive particles. Therefore, the use of the words sand blast nozzle and holder in the appended claims is to be interpreted broadly and as covering any analogous tool.

While the rubber washer 21, herein described is formed of soft live rubber, other materials may be used. Rubber is highly preferred but as a substitute material any hard metal may be used which is given substantially the same shape as washer 21. In the event that washer 21 is made of metal, a very thin resilient washer is positioned in circular recess 31 so that there will be no metal to metal engagement between the body of the nozzle and the metal washer. Such intervening thin resilient washer is obviously unnecessary when washer 21 is formed of soft live rubber.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a nozzle, means for fastening the nozzle to the body, and a resilient washer interposed between the end of the hose and the nozzle.

2. A sand blast nozzle and holder comprising a body adapted to be applied over a said blast hose, a nozzle, means for fastening the nozzle to the body, and a washer inerposed between the end of the hose and the nozzle, said washer presenting tapered interior surfaces which reduce from the interior size of the hose to the interior size of the nozzle.

3. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a nozzle, means for fastening the nozzle to the body, and a washer interposed between the end of the hose and the nozzle, said washer presenting tapered interior surfaces which reduce from the interior size of the hose to the interior size of the nozzle, the forward end of the washer being recessed to partially receive the rear end of the nozzle.

4. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a flanged nozzle, a bonnet on the body engageable with the flange of the nozzle to fasten the nozzle to the body, and a resilient washer interposed between the nozzle and the end of the hose, said washer having forwardly tapering interior surfaces reducing from the internal diameter of the hose to the internal diameter of the nozzle.

5. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a flanged nozzle, a bonnet on the body engageable with the flange of the nozzle to fasten the nozzle to the body, and a resilient washer interposed between the nozzle and the end of the hose, said washer having forwardly tapering interior surfaces reducing from the internal diameter of the hose to the internal diameter of the nozzle, the forward face of the washer being recessed to partially receive the rear end of the nozzle.

6. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a flanged nozzle, a bonnet on the body engageable with the flange of the nozzle to fasten the nozzle to the body, and a resilient washer interposed between the nozzle and the end of the hose, said washer having forwardly tapering interior surfaces reducing from the internal diameter of the hose to the internal diameter of the nozzle, the interior of the nozzle being flared at its rear end to approximately the internal diameter of the forward end of the washer.

7. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast

hose, a nozzle, means for fastening the nozzle to the body, and a rubber washer interposed between the end of the hose and the nozzle, said rubber washer presenting forwardly tapering interior surfaces which reduce from the interior size of the hose to the interior size of the nozzle at its rear end.

8. A sand blast nozzle and holder comprising a body adapted to be applied over a sand blast hose, a nozzle, means for fastening the nozzle to the body, and a rubber washer interposed between the end of the hose and the nozzle, said rubber washer presenting forwardly tapering interior surfaces which reduce from the interior size of the hose to the interior size of the nozzle at its rear end, said nozzle presenting a rearwardly flared rear end which forms a smooth continuation of the forwardly tapering interior surfaces on the washer.

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