June 26, 1951 W. E. ANDERSON 2,558,229

OUTLET NOZZLE STRUCTURE FOR MATERIAL APPLYING EQUIPMENT

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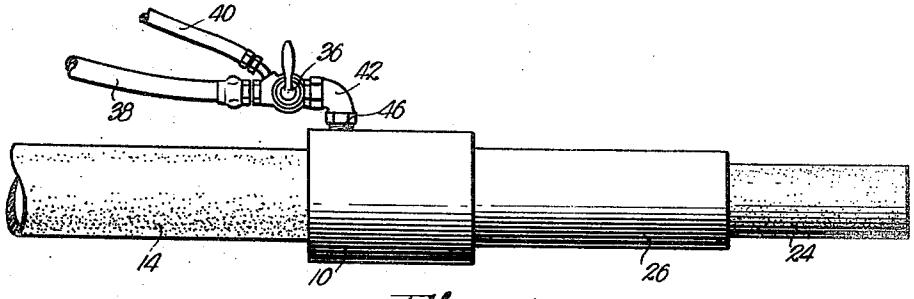


Fig. 1.

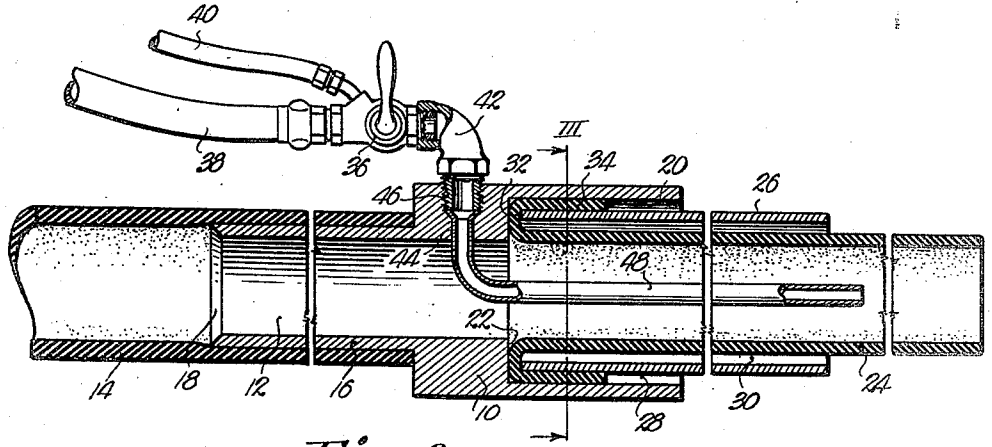


Fig. 2.

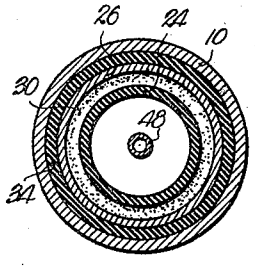


Fig. 3.

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OUTLET NOZZLE STRUCTURE FOR MATERIAL APPLYING EQUIPMENT

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This invention relates to the art of construction, building repair and the like, and more specifically to apparatus for applying cementitious substances, the primary object being to provide improvements in outlet nozzle structure for such equipment.

The most important object of this invention is the provision of a nozzle for applying cementitious substances similar to that disclosed in U. S. Letters Patent No. 2,303,810, dated December 1, 1942, but having refinements of construction rendering the same not only more efficient in operation, but more particularly, appreciably longer lasting.

Another important object of this invention is to provide a nozzle adaptable to receive cementitious mortar under pressure and having a resilient tubular outlet spout so disposed within a hollow mortar receiving body as to be extremely resistant to wear and deterioration due to the action of said mortar thereagainst as it passes through the spout.

A further object of this invention is the provision of a nozzle having a hollow body telescopically receiving a tubular, rubber-like spout and a sleeve surrounding the spout in spaced relation thereto for holding the spout in place whereby the latter is free to flex as mortar is forced therethrough.

Other objects will be made clear or become apparent during the course of the following specification, reference being had to the accompanying drawings, wherein:

Figure 1 is a side elevational view of an outlet nozzle structure for material applying equipment made in accordance with the present invention, certain associated connections thereto being shown fragmentarily.

Fig. 2 is a substantially central longitudinal sectional view taken through the nozzle shown in Fig. 1; and

Fig. 3 is a transverse cross sectional view taken on line III—III of Fig. 2.

An elongated body 10 has a longitudinal bore 12 therethrough communicating at one end thereof with a preferably flexible conduit 14 that leads from a feeder (not shown). Mortar, such as conventional plastic building materials made by mixing lime, cement or the like with sand, water and oftentimes other materials, constitutes the substances to be applied by the nozzle forming the subject matter hereof. The feeder, above mentioned, may constitute any device for moving the sand and cement into conduit 14

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such as that shown and described in the above identified patent.

The body 10 has a portion of its length reduced in outside diameter as at 16 to telescopically receive the conduit 14 and an internal bevel 18 is formed in bore 12 adjacent the outermost end of said portion to facilitate free passage of the sand and cement mixture from conduit 14 into bore 12 of body 10.

The diameter of the bore 12 adjacent that end of body 10 opposite to portion 16 is greater than the remainder of bore 12 at 20, presenting a continuous internal shoulder 22 facing outwardly toward said opposite end of body 10.

An elongated, resilient member 24 formed from rubber or the like and presenting an outlet spout for the substances to be applied by the nozzle is telescopically received by enlarged section 20 of the bore 12, a portion of member 24 extending outwardly a distance beyond body 10. The inside diameter of the member 24 is substantially the same as the diameter of the bore 12 extending from beveled end 18 to shoulder 22, while the outside diameter of member 24 is appreciably smaller than the diameter of section 20 of bore 12.

A tubular sleeve 26, also extending into section 20 of bore 12 and projecting outwardly from body 10, but terminating inwardly from the outermost end of member 24, has an outside diameter less than the diameter of section 20 of bore 12 and an inside diameter greater than the outside diameter of member 24. This sleeve circumscribes a greater portion of the member 24 as is clearly illustrated.

The relative diameters of section 20 of bore 12, sleeve 26 and member 24, presents a space 28 between section 20 and sleeve 26 and another space 30 between sleeve 26 and member 24, the width of space 28 being substantially the same as the thickness of material from which the walls of member 24 is made.

The innermost end of the member 24 is rebent upon itself, overlapping the proximal end of sleeve 26 as at 32 and extending as at 34 in overlapping relation to the marginal edge of said end of sleeve 26. That portion 34 of member 24 is disposed within the space 28 while that portion 32 thereof abuts directly against the shoulder 22. The width of shoulder 22 is substantially equal to two thicknesses of the walls forming member 24, plus the thickness of the wall of sleeve 26 and the width of space 30.

A manually operable valve 36 capable, when open, of simultaneously admitting air and water from hoses 38 and 40 respectively, is joined to

body 10 through the medium of an elbow fitting 42. An inlet opening 44 formed in body 10 and communicating with bore 12, threadably receives a fitting 46 to which elbow 42 is connected. An L-shaped pipe 48 having its shorter leg fitted into opening 44 in register with the fitting 46, is disposed with its longer leg in co-axial relationship with bore 12. The opening 44 is disposed between portion 16 of body 10 and section 20 thereof and the long leg of pipe 48 terminates beyond the outermost end of sleeve 26 and spaced inwardly from the free end of member 24.

The hose 40 has connection with a source of liquid such as water under pressure (not shown) while hose 38 communicates with a source of compressed fluid, also not shown.

In operation, the valve 36 is opened to simultaneously admit air and water from hoses 38 and 40 respectively into member 24 through pipe 48. Suction at the outlet end of pipe 48 created by the compressed fluid from hose 38 will draw the sand and cement mixture from conduit 14 into body 10. This mixture will admix with the water emanating from pipe 48 at a point spaced outwardly from the outlet end of pipe 48. The mortar of sand, water and cement passing from member 24 can then be applied as desired by manual manipulation of the entire nozzle structure.

It has been found by actual practice that replacement of member 24 when made and disposed as above described becomes necessary only after long and continued use. The sharp-edged, gritty sand-like particles as well as the cement used in the building substance, will wear away member 24 very slowly compared with like members in other types of nozzle structures. Since that part of the entire length of member 24 against which the material impinges is freely suspended within body 10, unrestricted flexing thereof is made possible whenever individual particles of such material contact the innermost surfaces of member 24.

No fastening means for member 24 and sleeve 26 to body 10 is necessary other than a simple slip fit since the pressure within body 10 and member 24 adequately holds such parts assembled while in use. Thus replacement of member 24 and clearing of the entire nozzle is simply and easily accomplished. Furthermore, it is obvious that cheapness of construction and durability of the entire assembly is one of its most advantageous characteristics.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An outlet nozzle structure for material handling equipment comprising a body having a longitudinal bore formed therethrough; a resilient tubular member within said bore and extending outwardly from one end of said body; and means for holding said member within the bore with a portion of its length in a suspended condition, said means including a sleeve circumscribing a portion of the length of said member, the entire innermost face of said sleeve being spaced from said member, one end of said member being rebent upon itself over the proximal end of said sleeve.

2. An outlet nozzle structure for material handling equipment comprising a body having a longitudinal bore formed therethrough; a resilient tubular member within said bore and extending outwardly from one end of said body; and means for holding said member within the bore with a portion of its length in a suspended condition, said means including a sleeve circumscribing a portion of the length of said member, the entire innermost face of said sleeve being spaced from said member, one end of said member being rebent upon itself over the proximal end of said sleeve, said sleeve having a portion thereof extending into said bore with said rebent portion of the member slidably engaging the side walls of said body forming the bore.

3. An outlet nozzle structure for material handling equipment comprising a body having a longitudinal bore formed therethrough; a resilient tubular member within said bore and extending outwardly from one end of said body; and means for holding said member within the bore with a portion of its length in a suspended condition, said means including a sleeve circumscribing a portion of the length of said member, the entire innermost face of said sleeve being spaced from said member, one end of said member being rebent upon itself over the proximal end of said sleeve, said body having a continuous annular shoulder formed in said bore thereof, the one end of said member abutting said shoulder.

4. An outlet nozzle structure for material handling equipment comprising a hollow body having an inlet opening and an outlet opening; a sleeve extending into said outlet opening and spaced from the inner walls of the body; and a tube of material having frictional resistance against slippage relative to the body when engaging the same, said tube extending into the sleeve, one end of the tube being rebent, upon itself in looped relationship to the innermost end of the sleeve, and extending into frictional engagement with said inner walls of the body.

5. An outlet nozzle structure for material handling equipment comprising a body having a bore therethrough provided with an inlet end and an outlet end; a sleeve extending into said bore at the outlet end thereof and spaced from the inner walls of the body; and a flexible tube extending into said sleeve, said tube being rebent upon itself in looped relationship to the innermost end of said sleeve, and extending into frictional engagement with the proximal walls of the body and the sleeve, that portion of the bore extending from the inner end of said tube to the inlet end of the bore having a diameter substantially the same as the inside diameter of the tube.

6. In nozzle structure, a hollow body having an open end; and a nozzle assembly adapted for insertion into said open end of the body, said assembly comprising a sleeve, and a tube of compressible material within the sleeve, that end of the tube within the body being rebent upon itself in looped relationship to a portion of the outer face of the sleeve adjacent the proximal end of the latter and being compressed between the sleeve and the body for holding the assembly against displacement with respect to the body.

7. In nozzle structure, a hollow body having an open end; and a nozzle assembly adapted for insertion into said open end of the body, said assembly comprising a sleeve, and a resilient tube within the sleeve, that end of the tube within the body being rebent upon itself in looped relationship to a portion of the outer face of the sleeve adjacent the proximal end of the latter for holding the tube against displacement with respect to the sleeve, said body having a continuous, out-

wardly-facing shoulder formed therein, that portion of the tube on the outer face of the sleeve being in engagement with the body for holding said assembly within said body with the looped end of said tube bearing tightly against said shoulder.

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