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BUILDING SURFACE APPLICATOR
Andrew F. Black, Niles, Ill., assignor to Air-Pressure Damp-Proofing Services, Inc., Niles, Ill., a corporation of Illinois
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This invention relates to an applicator for surfacing areas which require various kinds of surface coatings, especially weather protective.

Most building structures require the application of protective coatings on all exterior areas to ensure against the penetration of moisture. This is especially so for foundations and roofs. Such final surfacings are composed of mixtures of some form of a solid and a viscous substance, generally applied through a pressured spray equipment. The widely current practice is to apply a coating of asphalt infused with glass fibers. The spray equipment generally is a gun-type structure having separate continuous chambers dedicated to separate sources of asphalt and glass fibers which are simultaneously discharged from the nozzleled end of the structure and impinged against the building surface as an integrated mixture in the nature of a reinforced somewhat planot lamina.

In the adaptation shown in the accompanying drawings:
FIG. 1 is a perspective view of an in-use surfacing applicator constructed in accordance with this invention;
FIG. 2 is a side elevation of the applicator shown in FIG. 1;
FIG. 3 is an enlarged, partly cross-sectional, partly elevational view of the nozzle and supporting ends of the applicator shown in FIGS. 1 and 2;
FIG. 4 is a further enlarged, longitudinal, sectional view of the nozzle and supporting ends of the applicator shown in the aforesaid figures;
FIGS. 5, 6, and 7 are transverse, cross-sectional views of the nozzle end of the aforesaid applicator taken respectively, on the planes of the lines 5—5, 6—6 and 7—7 of FIG. 4; and
FIG. 8 is a right-hand end view of the applicator taken on the plane of the line 8—8 of FIG. 4.

The essential concept of this invention involves a plurality of tubular elements 11, 12 and 13, each with some form of a discharging nozzle 14, 15 and 16, respectively, arranged one within the other with their breech ends structured for connection, respectively, to sources of a solid substance, a viscous substance, and air pressure, and their discharging nozzle ends 14, 15 and 16 so related as to cause the two substances to be integrated into an intimate mixture for discharge from the nozzle end of the outer element as an integrated mixture for impingement onto a surface requiring a protective coating.

An applicator embodying the foregoing concept comprises a plurality of tubular elements 11, 12 and 13, each with some form of a discharging nozzle 14, 15 and 16, respectively, arranged one within the other with their breech ends structured for connection, respectively, to sources of a solid substance, a viscous substance, and air pressure, and their discharging nozzle ends 14, 15 and 16 so related as to cause the two substances to be integrated into an intimate mixture for discharge from the nozzle end of the outer element for impingement as a lamina of predetermined pattern on a selected surface. All of these tubular elements 11, 12 and 13 are of predetermined lengths of standard tubing with appropriately threaded and flanged connection for connection to conventional sources of the respective substances, and the discharging end nozzles 14, 15 and 16 formed by conventional pipe fittings of one kind or another, all of which presently will be explained in detail.

The outer tubular element 11 is telescoped at its breech into a sleeve 17 which embraciously seats a ring 18 secured thereto by a series of shouldered screws 19. Within this ring 18 is a bushing 21 having external and internal threads 22 and 23 and oppositely-disposed end flanges 24 and 25. The bushing 21 is screwed into ring 18 for support and limited relative movement thereon of the intermediate element 13, as presently will be described. The flange 24 is of external hexagonal shape to permit the application of a wrench for assembling and disassembling the applicator to a conventional mechanism for supplying the aforesaid substances. The flange 25 is internally circular and serves to permit limited axial shifting of the tubular element 13 and the bushing 21.

The inner tubular element 12 is a length considerably less than the outer tubular element 11 and concentrically arranged within the outer tubular element 11 with the breech end of the tubular element 12 formed with an angular-shaped head 26 which provides for the attachment of the tubular element 12 to the hereinafter described source of viscous substance.

The intermediate tubular element 13, as above shown, comprises a pair of concentrically-arranged tubes hereinafter referred to as the "first intermediate tube 27" and the "second intermediate tube 28." The intermediate element 13 could be a single tube, if desired, sealed to a sleeve fitting 29 (FIGS. 3 and 4), to be hereinafter described, arranged externally on such a single tube. However, the arrangement of the sleeve 29 on the second intermediate tube 28 makes for a more facile and effective use of an applicator of this character.

The first intermediate tube 27, as here shown, is of a length slightly less than that of the inner tube 12, which is embraced by the tube 27. The inner end of this first intermediate tube 27 is formed with a thread 31, for the adjustable attachment of an extension 32, and the breech end mounts a threaded collar 33. The breech end of the tubes 12 and 27 are disposed in spaced concentric relationship by an apertured ring 34. The threaded collar 33 provides for the attachment of the tube 27 to a hereinafter described source of air pressure which enters the tube 27 through the series of apertures 35 in the ring 34 as indicated by the arrows A (FIGS. 3, 4 and 8).

The second intermediate tube 28, as here shown, is of a length somewhat less than the first intermediate tube 27 which the former embraces. The inner end of the tube 28 telescopes a sleeve 36 which fits in and closes the space between the concentrically-arranged ends of the tubes 27 and 28. The breech end of the tube 28 mounts a telescopically-fitted sleeve 37 with an angled head 38. These breech ends of the tubes 27 and 28 are supported in concentric relationship by an apertured ring 39. The head 38 provides for the attachment of the tube 28 to the hereinafter-described source of air pressure which enters through apertures 40 in the ring 39, as indicated by the arrows A (FIGS. 3, 4 and 8).

The nozzle 44, for the end of the outer tube 11, as herein shown, comprises an extension 41 mounting, in its outer end, a ring 42 and secured to the end of the outer tube 11 by a telescoping sleeve 43. The ring 42 has a circular port 44 at the end of a tapered bore permitting the outer end of the extension 41. The space between the ring 43 and the extension 32 constitutes a chamber 46 (FIG. 3) wherein the respective substances, being discharged from the hereinafter-described nozzle 15 and moving along the extension 41, are integrated into an intimate mixture for discharge through the port 44 as indicated by the arrows 47.

The ring 42 is adjustable along the tube 11 to contact with the shiftable extension 42 to alter the nature of the mixing chamber 46 and thereby influence somewhat the pattern of the reinforced lamina which is to be impinged on the selected surface.

The nozzle 15 is a dual structure including the extension 32 and a fitting 48 threaded on the inner, discharge end of the tube 11, as best shown in FIG. 4. The extension 32 is formed with a circular discharge port 49 in-
wardly from which extends a taper bore 51. The fitting 48 is in the form of a threaded cap adjustable on the inner end of the inner tube 11 and having an axial discharge port 52. Such a fitting, being axially shiftable on the tube 11, serves a two-fold purpose. It regulates the air stream emitted from one part of the heretofore described dual-structured nozzle 16 and, also, influences the discharge of the viscous substance from the tube 11, into the chamber 44 in the extension 32, as indicated by the arrows at C in FIG. 4.

The nozzle 16, as already noted, is a dual structure comprising an apertured ring 53 and the apertured sleeve 29. The apertured ring 53 fits in and closes the space between the tubes 11 and 27 whereby the air in the form of jets issues through the apertures 54, as indicated by the arrows at B in FIGS. 4 and 5. The sleeve 29 is of cylindrical form bored for a tight sliding fit on the intermediate tube 28 and internally recessed to form a chamber 56 from which pressured air issues as jets through the circular series of apertures 57, as indicated at A in FIGS. 4 and 5. The rear end of the sleeve 29 is tapered, as shown at 58, to lessen obstruction to the flow of the solid substance through the outer tube 11. Air is admitted from the tube 28 to the chamber 56 through a series of ports 59 in the tube 28 (FIGS. 4 and 9).

The positioning of the sleeve 29 adjacent the outer end of the tube 28 causes the air jets, issuing through the apertures 57, to create an ejector action tending to create a vacuum in the tube 11 rearwardly of the sleeve 29.

It is such a condition in the tube 11 that is relied upon to draw the solid substance along the tube from the breech end thereof. As such a solid flow passes the outer end of the sleeve 29, the jets issuing from the apertures 57 accelerate the projection of such material into the mixing chamber 26 and the discharge through the nozzle 14 of its mixture with the viscous substance issuing from the nozzle 15. The adjustment of the sleeve 29, along the tube 28 and relative to the ports 59, will influence the effective force of the jets issuing through the apertures 57.

The jets of air issuing through the apertures 54 in the ring 53 (FIGS. 4 and 5) from the tube 27, and exiting through the limited space around the fitting 48, tend to effect an ejector action in the extension 32. This will facilitate the movement of the viscous substance through the port 52 and the pressuring of the substance along the extension 32 for its discharge through the port 49 into the mixing chamber 46.

The herein-described applicator is structured for attachment of the breech end to conventional mechanisms connected to the desired controlled sources of viscous and solid substances and air pressure. The forms of the control mechanism would depend upon the nature of the viscous and solid substances which are to be integrated and impinged as a protective lamina on exposed surfaces.

The applicator as herein illustrated and explained is especially designed for use in applying asphalt reinforced by glass fibers. Hence, the breech end of the tube 11 has been structured for the mounting of a conventional glass-fiber cutter mechanism 61 and the breech ends of the tubes 12, 27 and 28 are structured, as herebefore explained, for connection to a conventional mechanism 62 for controlling the pressured flow of asphalt to the inner tube 12 and air to the tubes 27 and 28. FIGS. 1 and 2 incorporate outline views of these conventional mechanisms 61 and 62.

The fiber-cutting mechanism 61 is detachably positioned on the sleeve 17 by means of a bracket 60 into the sleeve through a nipple connection 60a. A guide wire 63 is shown fixed to the mechanism 62 to position a leaf 64 to direct glass-fiber roving 65 from a source of supply (not shown) to knives (not shown) journaled in a housing 66 and driven by an air-pressure motor indicated at 67. Such a conventional cutter mechanism 61 includes means for altering the form and speed of the knives and thereby, the length of fibers severed from the roving 65, as discharged into the tube 11.

The conventional mechanism 62 embodies a hand grip 68 mounting connections 69, 70 and 71 for the attachment of conventional hoes 72, 73 and 74 leading to sources of asphalt under the control of a valve-actuating trigger 75. The head 76, of such a mechanism 62, mounts a threaded nipple 77 which is screwed into the bushing 21 (FIG. 3) for effective connection of the end parts 26, 33 and 38 to the respective tubes 12, 27 and 28.

The trigger 75 is appropriately connected to the motor 67 for the mechanism 61. This will ensure the synchronizing of the cutting of the roving 65 and the consequent flow of the fibers through the tube 11 with the flow of the asphalt and air through the tubes 12 and 27.

The hereinshown and described applicator is used as follows for applying a lamina of glass-fiber, reinforced asphalt:

Upon the applicator being connected to the mechanisms 61 and 62, as shown in FIGS. 1 and 2, the operator grips the applicator with one hand and the hand grip 68 with the other, as shown in FIG. 1. Upon pressing the trigger 75 there is a simultaneous starting of the mechanism 61 and the opening of the valves for introducing the flow of asphalt into and through the tube 12 and air pressure through the tubes 27 and 28.

The pressured flow of the fibers through the tube 11, as emitted from the mechanism 61, and the pressured flow of asphalt from the port 49 enter the mixing chamber 46 wherein these substances are integrated into an intimate mixture and discharged from the port 47 and impinged onto the desired surface as a reinforced surface-protecting lamina.

During the discharge of the mixture from the port 47, the operator moves the applicator to effect the desired pattern of the lamina.

Variations and modifications in the details of structure and arrangement of the parts may be resorted to within the spirit and coverage of the appended claims.

I claim:

1. An applicator, for discharging from its forward end a mixed flow of viscous and solid substances to impinge on a surface a reinforced lamina, comprising,

(a) an outer tube connectable at its breech end to a supply source of a solid substance, and having a nozzle discharge end,
(b) an inner tube connectable at its breech end to a supply source of a viscous substance, and having a nozzle discharge end located inwardly of the nozzle discharge end of the outer tube to form a mixing chamber within the outer tube nozzle,
(c) a first intermediate tube embracing the inner tube, connectable at its breech end to a supply source of air pressure, having a nozzle discharge end disposed adjacent inwardly of the inner tube nozzle end into the outer tube mixing chamber, and
(d) a second intermediate tube embracing the outer tube, and having a nozzle discharge end disposed adjacent inwardly of the nozzle end of the inner tube to effect an ejector action on the outer tube to facilitate the discharge of the viscous substance from the inner tube nozzle end into the outer tube mixing chamber, and

FIGS. 1 and 2 incorporate outline views of these conventional mechanisms 61 and 62.
5. Chamber and discharge the two substances as an integrated mixture from the nozzle of the outer tube.

2. An applicator, for discharging from its forward end a mixed flow of viscous and solid substances to impinge on a surface a reinforced lamina as set forth in claim 1 wherein the source of solid substance is glass fibers from a roving cutter positioned on the breech of the outer tube, and the source of the viscous substance is asphalt.

3. An applicator, for discharging from its forward end a mixed flow of viscous and solid substances to impinge on a surface a reinforced lamina as set forth in claim 1 wherein the nozzle ends of the respective tubes are adjustable to regulate the flow of substances and the air through the respective tubes for regulating the nature of the mixture and the pattern of the lamina.

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EVERTT W. KIRBY, Primary Examiner.

LOUIS J. DEMBO, RAPHAEL M. LUPO, Examiners.