June 18, 1935. H. A. CONLEY 2,004,978

APPARATUS FOR APPLYING PROTECTIVE COATINGS

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Fig. 1.

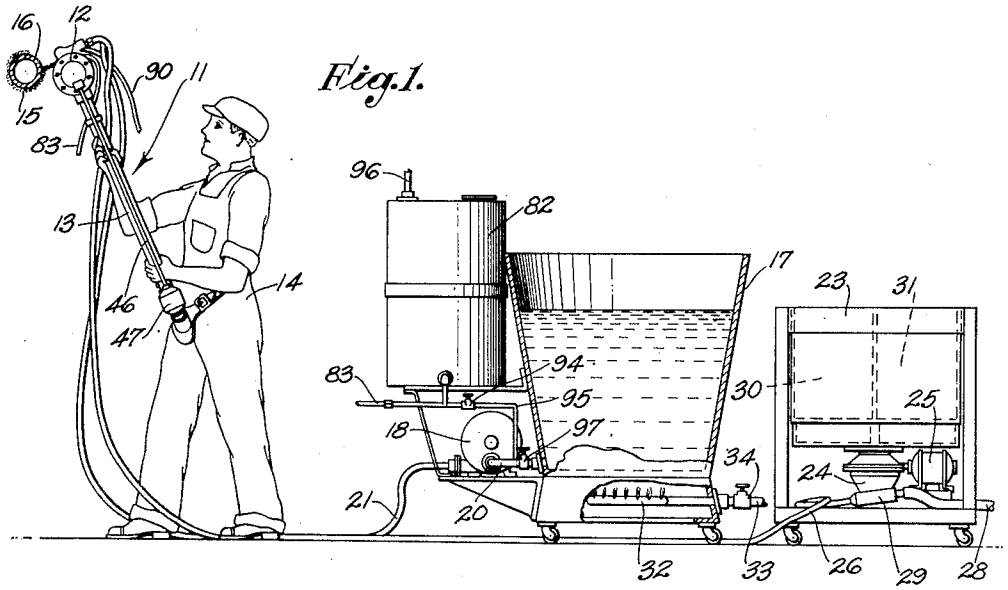


Fig. 3.

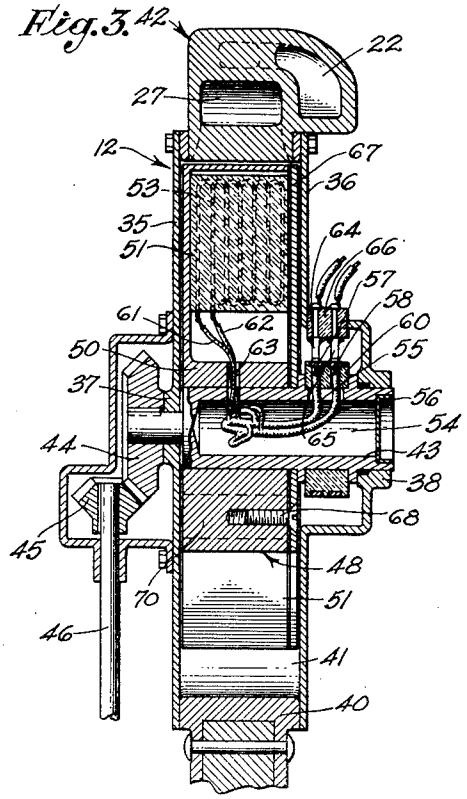
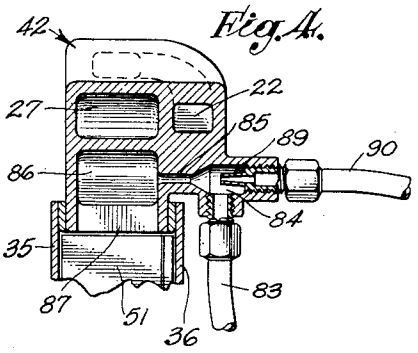


Fig. 4.



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Fig. 2.

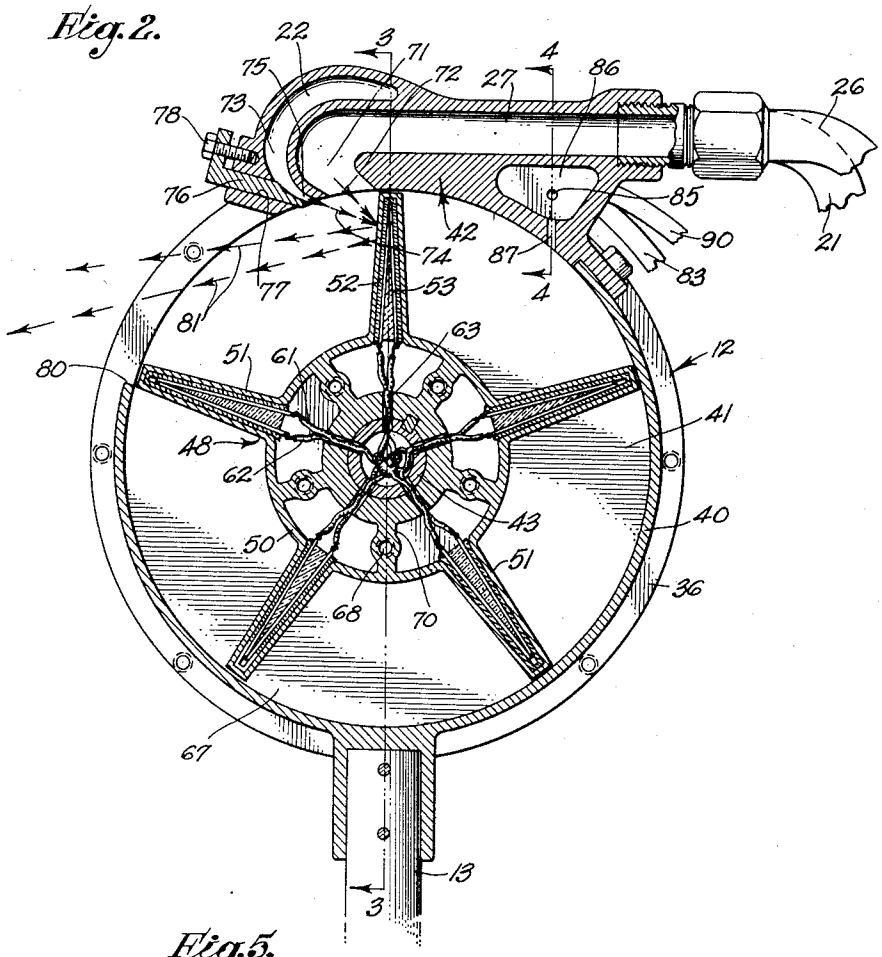
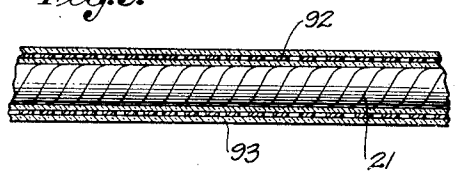


Fig. 5.



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UNITED STATES PATENT OFFICE

2,004,978

APPARATUS FOR APPLYING PROTECTIVE COATINGS

Hugh A. Conley, Lynwood, Calif., assignor to Conley Plastering Machine Company, Inc., Compton, Calif., a corporation of California

Application November 7, 1930, Serial No. 494,063

9 Claims. (Cl. 91—44)

My invention relates to means for applying protective coatings to objects, and relates particularly to a device for applying a protective coating containing a binder and protective material which is applied in a liquid or semi-plastic form and becomes relatively solid upon cooling or when exposed to the atmosphere.

A protective coating which may be used in the practice of my invention contains a tar such as asphalt and an aggregate consisting of finely ground rock and sand. This mixture is extensively employed for protective coatings on pipe lines to prevent rust, corrosion, and electrolytic destruction of the pipes. One method of applying this protective coating is to heat a mixture thereof so as to reduce it to plastic state, and to apply it to the surface to be protected by use of trowels or means of a similar character.

My invention comprehends a mechanical device which forms the mixture and applies same to the pipe in continuous operation. In the preferred practice of the invention the materials are delivered separately to an applying head wherein the materials are mixed. This applying head is equipped with means for throwing the ingredients onto the surface to be protected in the form of a coat. When a material of solid or semi-solid character such as asphalt is to be used as a binder the material is heated in a container and delivered in fluid condition to the applying head. The aggregate, which may be any suitable divided substance, such as gravel or crushed rock, is conveyed to the head through a separate conduit where it is combined with the fluid asphalt and batted onto the surface to be coated by means of a rotary batting member contained within the head.

It is an object of the invention to provide a device for applying a heated or adhesive substance, and it is a further object to provide means for intermixing another material with the heated or adhesive substance.

A further object of the invention is to provide a device of this character having flinging or batting members equipped with means for preventing the material which is being applied from adhering to and piling up on the surfaces of the flinging or batting members.

It is an object of my invention to provide a device of this character having means for heating the flinging or batting members so that when materials of the character of tars or asphalts are handled, such materials will not stick to the surfaces thereof, and it is a further object of the invention to provide means for applying a lubricating substance, such as water or a hydrocarbon liquid, to the surfaces of the flinging or batting members to prevent sticking thereon of materials of adhesive character.

A further object of the invention is to provide a device of the above character having a batting member with hollow blades and means for applying heat to the inner surfaces of said hollow blades in order to heat such blades to accomplish the results above set forth.

It is a further object of the invention to heat the blades of the batting member by use of electrical elements contained therein.

It is a further object of the invention to provide a device of the above character having a container for a viscous material, and means for heating the conduit by which the material is carried to the applying head.

A further object of the invention is to provide a device of this character which may be readily cleaned so that the materials of adhesive and viscous nature employed therein will not harden in the conduits or passages and clog the same. When the apparatus is shut down after a period of operation, this cleaning means is employed to clean out the various conduits so as to leave them in condition for an immediate resumption of operation at any desired time.

Further objects and advantages of the invention will be made evident throughout the following part of the specification.

Referring to the drawings, which are for illustrative purposes only,

Fig. 1 is an elevational view showing equipment embodying my invention and illustrating the manner of its use.

Fig. 2 is an enlarged vertical section through the applying head employed in the preferred form of my invention.

Fig. 3 is a vertical cross section on a plane represented by the line 3—3 of Fig. 2.

Fig. 4 is a cross section on a plane represented by the line 4—4 of Fig. 2.

Fig. 5 is a partly sectioned fragmentary detail showing a portion of the conduit for carrying heated or adhesive material from the container to the applying head.

My present invention employs some of the principles disclosed in my application Ser. No. 479,113, entitled Means for applying plaster materials, filed September 1, 1930, which terminated in Patent No. 1,918,799, issued July 18, 1933, and is an improvement thereon.

As shown in Fig. 1, the invention provides a manually operated applier 11 having an apply-

ing head 12 equipped with a suitable handle 13 so that it may be held by a workman 14 in position for applying a protective coating 15 to a pipe 16 or other object. The invention also includes a vat or container 17 in which a binder, such as tar, asphalt, or an adhesive liquid, may be placed. A pump 18 is connected to the container 17 by piping 20, this pump being adapted to force the binder material through a conduit 21 to the passage 22 in the applying head 12. A hopper device 23 for containing an aggregate or granular material which is to be combined with the binder and applied to the pipe 16 in the form of a protective coating 15, is equipped with a delivery member 24 having a motor 25 for driving it in such a manner that it will continuously deliver the granular or aggregate materials from the hopper 23 to a flexible conduit or hose 26 which extends to the pasage 27 of the applying head 12, it being a feature of the device to carry the granular or aggregate materials through the conduit 26 by means of a blast or flow of air which is introduced into the conduit 26 from an air hose 28 through an injector 29 situated at the outlet of the delivery member 24. As indicated by dotted lines in Fig. 1, the hopper 23 may have compartments 30 and 31 for containing granular materials of different size. For one type of coating sand is placed in the bin 30 and a gravel is placed in the bin 31, these two materials being intermixed by the delivery device 24 andcombined with the air stream flowing through the hose or conduit 26. The vat or container 17 is equipped with heating means for keeping the contents thereof in heated or fluid condition, if the same is of a character which requires reduction to fluid state. For such purpose I show a burner 32 fed with fuel from a pipe 33 through a valve 34.

Referring especially to Figs. 2, 3, and 4, the applying head 12 includes circular side plates 35 and 36 having bearings 37 and 38 axially formed therein, and a cylindrical member 40 which partly encloses a cylindrical chamber 41 within the head 12. Mounted in the upper end of the head and between the upper edges of the side plates 35 and 36 is a delivery member 42 comprising a body having the passages 22 and 27 therein. In the head 12 is a means for moving materials from the head to the article or object to be coated with such materials. This means includes a shaft 43 which is supported in the bearings 37 and 38 and has a gear 44 on its leftward end adapted to be driven by a pinion 45 mounted on a shaft 46 which extends from a motor 47 situated at the lower end of the handle 13. On the central portion of the shaft 43 is a rotary flinging or batting member 48 consisting of a cylindrical hollow body 50 having hollow radial blades 51 projecting outwardly therefrom so as to form flinging or batting blades. Within these blades are insulating bodies 52 having electrical heating elements 53 therein. The central and rightward portion of the shaft 43 is hollow so as to form a chamber 54 through which wires 55 and 56 may be carried from collector rings 57 and 58 mounted on a ring 60 of insulating material carried on the rightward portion of the shaft 43. From conductors 55 and 56 individual wires 61 and 62 are carried through holes 63 in the shaft 43 and the hub 50 to the ends of the heating element 53. In position for engagement with the collector rings 57 and 58, brushes 64 and 65 are supported in a body of insulating material 66 carried in the side plate 36. The hollow parts of the rotary member 48 are closed by an end plate 67 secured in place by screws 68 which thread into holes formed in radial walls 70 of the hub 50.

As clearly shown in Fig. 2 the delivery member 42 is preferably in the form of a cast body having the passages 22 and 27 therein to which the respective conduit members 21 and 26 connect by the use of suitable hose fittings. The forward end 71 of the passage 27 is downwardly and rearwardly curved so that the stream of air and granular materials, such as sand and gravel, are directed into the path of movement of the blades 51, as indicated by arrows 72. In a like manner, the forward end 73 of the passage 22, lying on the outside of the forward end 71 of the passage 27, curves downwardly and rearwardly so as to spray the liquefied binding material, such as asphalt, into the path of movement of the blades 51, as indicated by arrows 74. The mouth 75 of the passage 22 may be adjusted in width by use of a valve plate 76 which works in a slot 77 and has screws 78 for moving same. The materials delivered through the passages 22 and 27 are struck by the blades 51 and impelled outwardly through an opening 80 in the head, as indicated by arrows 81, these materials being intermixed and adhering in the form of a coating 15 on the object which they strike. Heating of the blades is for the purpose of preventing the viscous binding material from adhering to the surfaces thereof. In addition to this heating means for preventing adhesion of materials to the blade members 51, I show a means for lubricating the surfaces of the blades before they reach the point at which the materials are delivered into the path of movement of the blades. This means, as shown in Figs. 1, 2 and 4, comprises a container 82 for a suitable liquid. Where tar is used as a binder, the liquid placed in the container 82 may be a light hydrocarbon such as kerosene. From the container 82 a hose 83 extends to the head 12, where it connects to an inlet chamber 84 which communicates through an opening 85 with a passage 86 having a mouth 87 communicating with the interior of the applying head 12. The lubricating fluid delivered through the hose 83 into the inlet chamber 84 is picked up by a blast of air issuing from a nozzle 89 which is fed by air from an air hose 90, thus causing a spray of air and lubricating fluid to be delivered through the passage 86 and the mouth 87 thereof into the path of movement of the blades 51 so as to exert a scouring action and thereafter coat the surfaces of the blades with lubricant just prior to the time at which the blades engage the materials issuing from the passages 22 and 27.

The conduit 21 is preferably a metal hose and has heating means included therewith for keeping the fusible or liquefiable solid, such as asphalt, in fluid condition while being carried from the container 17 to the delivery passage 22 of the delivery member 42. This heating means I show in Fig. 5. The conduit 21 is surrounded by an electrical heating element 92 enclosed in a suitable wall of insulating material 93. Although I prefer to employ as a binder a tar, such as asphalt, and reduce same to liquid state by application of heat, my apparatus may be employed to use a binder in liquid form and having a solvent therein so that it will readily harden when exposed to the air. Such a liquid might

be a mixture of tar and a light hydrocarbon product.

As shown in Fig. 1, the container 82 is connected through a valve 94 and piping 95 with the pipe 20 which leads to the pump 18, this providing means in my apparatus for thoroughly cleaning the pump, the conduit 21, and the passage 22 of Fig. 2 when it is desired to shut down the apparatus. The container 82 is placed under air pressure through an air pipe 96. By closing a valve 97 in the pipe 20 and opening the valve 94, the hot asphalt may be forced out of the pump 18, the conduit 21, and the passage 22. A continued flow of fluid from the container 82 will then wash out these members, leaving them in condition for resumption of activities at any time without necessity of cleaning out clogged passages.

I claim as my invention:

1. A device of the character described, including: a head; means for supporting said head; means for moving a viscous mixture of granular solids from said head to an object to be coated; and a delivery member for delivering the ingredients of said mixture to said head, said delivery member having an air passage for carrying a stream of air and an ingredient of said viscous mixture into said head, a passage for carrying another ingredient of said viscous mixture into said head, and a passage for a flow of fluid to lubricate said means for moving said mixture from said head.

2. A device of the character described for applying protective coatings, comprising; a container for a viscous material; a conduit leading from said container; means for heating said viscous binding material in said container; means for forcing said viscous material through said conduit; a container for granular materials; an air hose; means for forcing a blast of air through said air hose; delivery means for introducing granular materials into said air hose from said container for granular materials; an applying head connected to said conduit and said air hose adapted to receive and combine said viscous and said granular materials; and a rotor carried by said head having blades adapted to bat said combined materials against an object to be coated therewith.

3. A device of the character described for applying protective coatings, comprising: a container for a viscous fluid; a conduit leading from said container; means for heating said fluid in said container; means for forcing said fluid through said conduit; a container for granular materials; an air hose; means for forcing a blast of air through said air hose; delivery means for introducing granular materials into said air hose from said container for granular materials; an applying head connected to said conduit and said air hose adapted to receive and combine said viscous fluid and said granular materials; and a rotor carried by said head having radial blades adapted to bat said combined materials against an object to be coated therewith.

4. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; delivery means for feeding ingredients of a viscous mixture to said head; a rotary member in said head; radially disposed blades on said member for casting said viscous mixture from said head against said receiving surface; and walls forming a passage in said head adapted to supply a fluid for lubricating said blades.

5. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; means for feeding ingredients of a viscous mixture to said head; a rotary member in said head having blades for casting said viscous mixture from said head to said receiving surface; and means disposed within said blades for heating the surfaces thereof.

6. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; means for feeding ingredients of a viscous mixture to said head; a rotary member in said head having blades for moving said viscous mixture from said head to said receiving surface; walls forming a passage in said head for lubricating the surfaces of said blades; and means disposed in said blades for heating the surfaces thereof.

7. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; delivery means for feeding ingredients of a viscous mixture to said head; a rotary member in said head having blades for moving said viscous mixture from said head to said receiving surface; electrical elements disposed in said blades for heating the surfaces thereof; and conductors for supplying electric energy to said electrical elements.

8. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; delivery means for feeding ingredients of a viscous mixture to said head; a rotary member in said head having blades forming plane surfaces for moving said viscous mixture from said head to said receiving surface; electrical elements disposed in said blades for heating the surfaces thereof; and walls forming a passage in said head for lubricating said blade surfaces.

9. A device of the character described, including: a head; a support for said head by which it may be maintained in position adjacent to a receiving surface; means for feeding viscous and granular materials to said head; a rotary member in said head; walls forming blade members having plane surfaces for moving said materials from said head to said receiving surface; a lubricant source of supply; and walls forming a passage in said head for supplying lubricant to said plane surfaces.

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