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PROCESS OF PROTECTING INACCESSIBLE SURFACES AND COMPOSITION THEREFOR

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It is known to provide interior inaccessible walls (e. g. of gasometers) with a coating, e. g. by blowing in a coating medium in atomized form, with the aid of compressed gases, whereby the atomized drops deposit upon the said interior walls. In a similar manner tubular conducting means for gas (pipes, gas mains etc.) were provided with an oil coating by atomizing an oil.

As the basis of the present case, we have discovered that oil coatings as well as films of non-drying or slowly drying coating media can be produced in tubular conducting means in a simple and certain manner by pouring the coating media into the tubular conducting means. It is sufficient if the medium at times (occasionally) covers the bottom part of the conductor, if one chooses coating media which possess a great wetting and creeping capacity (i. e. high capillarity) and therefore climb up on the walls of the conductors (pipes), so that they finally cover the whole of their inner surface, such for example, as high boiling mineral oils and their solutions. The climbing up and further creeping of the medium is accelerated by means of layers with capillary spaces likely to be found upon the inner surfaces of the tubes, for example roughness, rust or flue dust (or fume) layers. If the pipes (or tubes) are constructed (or laid) with inclined portions, one appropriately permits the coating medium to flow in at the highest point, so that it wanders to the lowest (or deepest) places, where, if necessary, any excess can be withdrawn for re-use. In the case of conduits for gas, the excess, for example, can be withdrawn out of the water trap. In case of necessity, the pouring in of the medium can be performed two or more times.

The new process can serve various purposes. If a rust preventive medium is employed, for example oil or a solution of bitumen in high boiling petroleum or tar oil, a rust preventing film is produced. which at the places of connection (joints) and the places where welding has been performed, is of particular importance, since, as is known, a rust preventive coating applied to them before setting up (or installing) of the pipe, is broken down or destroyed in the production of the joint and then ordinarily can not be renewed (replaced) inside by an ordinary subsequent coating, being inaccessible.

Frequently an interior protection of pipe systems is necessary on account of liability to change in composition of the gases being conducted. For example, the danger of rusting in gas conductors is strongly increased by the recent frequent removal of benzol from the illuminating gas. In such and similar instances the new process provides a welcome possibility to coat an old pipe system (or network) interiorly with a reliable rust preventing film.

In conductors fed with dry gases there is frequently formed burdensome flue dust or flue rust. This can be bound or made harmless by the new process by the use of oil or oil with the addition of bitumen, resin, artificial resin or the like.

Leaks, especially in the sleeve joints or due to porosity of the conduit walls, can be effectually combatted by pouring a coating medium into the conduits. Dried out and shrunken sleeve packings fill themselves with the medium by absorption, and thereby give gas-tight joints. The pores and the canals, which make possible the escape of gas, are made to disappear or are stopped up by being filled with the coating agent.

In the stated uses a sticking, binding action (adhesiveness or stickiness) of the employed medium can be of advantage. This action or property can be increased by the addition of bitumen, resins, or artificial resin to the said oils, or by the use of polymerizing oils such as anthracene oil.

Sometimes it can be advantageous to introduce the coating medium in the form of an emulsion, for example if the interior surfaces are moist (e. g. wet with water), or if for other reasons a water content of the medium is desired.

This effect may also be used for removing water from water-wet pipe interiors, by using oil carrying therein an emulsifying agent, so that when the oil in excess, carrying such emulsifying agent (the latter being water-soluble, and oil-soluble or oil-insoluble) is applied to or reaches parts of the interior of the pipe that are wet with water, the oil and emulsifier form an emulsion with the water in the pipe. Such emulsion can be of the oil-in-water type or water-in-oil type. This prevents rusting by removing the water and/or by converting the water into an emulsion, leaving the pipes covered with an oily composition.

Many films, for example those of or containing mineral oil pitch (asphalt), can also be used to precipitate gum-resins from the gas, whereby the resins do not foul the valves of the gas burners. Also for precipitating other constituents from the gas, for example for after purification (subsequent purification), the coatings find application.

For more fully explaining the nature of the invention, and how the same is to be performed, we give in an illustrating and non-limiting sense, the following examples of oils and mixtures suitable for use in the invention, without of course limiting the invention to these specific examples.

Examples

1. Tar oil of a specific gravity of 1.0 and a boiling range of 250–350°C from which anthracene has been removed by cooling.

2. In 70 parts by weight of tar oil of a specific gravity of 1.0 and a boiling range of 250–350°C, 30 parts by weight of natural resin (colophonium) are dissolved while heating the tar oil to 100°C.

3. 75 parts by weight of tar oil of a specific gravity of 0.96 and a boiling range of 200–300°C are heated to 100°C. Then, while stirring, 25 parts by weight of artificial resin of the type of phenolformaldehyd are dissolved.

4. 20 parts by weight of petroleum asphalt of a melting point (R. & B.) of 70°C are melted, to which, while stirring, 80 parts by weight of tar oil with a specific gravity of 0.96 and a boiling range of 200–300°C are slowly added.

5. 90 parts by weight of tar oil of a specific gravity of 1.0 and a boiling range of 250–350°C are mixed with 10 parts by weight of purified tar oil from which phenol has been removed, with a boiling range of 150–180°C while stirring.

6. 65 parts by weight of tar oil of a specific gravity of 1.0 and a boiling range of 250–350°C are mixed with 15 parts by weight of purified tar oil of a boiling range of 150–180°C, and heated to 100°C. In this heated oil mixture, 20 parts by weight of natural resin (colophonium) are dissolved while stirring.

7. 70 parts by weight of tar oil of a specific gravity of 0.96 and a boiling range of 200–300°C are mixed with 10 parts by weight of tar oil with a boiling range of 150–180°C. The oil mixture is heated to 100°C and mixed with 20 parts by weight of ratificial resin of the type of phenolformaldehyd, whereby the resin is dissolved in the oil.

8. 20 parts by weight of petroleum asphalt with a melting point of 70°C (R. & B.) are melted and, while stirring, a mixture is added consisting of 70 parts by weight of tar oil with a specific gravity of 0.96 and a boiling range of 200–300°C, and 10 parts by weight of white spirit with a boiling range of 140–170°C.

9. Refined mineral oil (spindle oil) with a specific gravity of 0.89, with a boiling point of more than 300°C.

10. 15 parts by weight of melted natural resin (copal soluble in oil) is, in melted condition, dissolved with 85 parts by weight of refined mineral oil of a specific gravity of 0.89 and a boiling point of more than 300°C.

11. 75 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89, and a boiling point of more than 300°C is heated to 100°C. In this heated oil 25 parts by weight of artificial resin of the type of phenolformaldehyd modified with fatty acid are dissolved while stirring.

12. 20 parts by weight of petroleum asphalt (high vacuum bitumen) with a melting point of 90°C (R. & B.) are melted and mixed with 80 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of more than 300°C heated to 100°C.

13. 80 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of more than 300°C are mixed with 20 parts by weight of white spirit with a boiling range of 140–170°C while stirring.

14. 75 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of more than 300°C are mixed with 10 parts by weight of white spirit with a boiling range of 140–170°C and heated to 100°C. To this heated oil mixture 15 parts by weight of natural resin (copal soluble in oil) is added, after melting and, stirred whereby the resin is dissolved in the oil mixture.

15. 20 parts by weight of artificial resin (cumar, indene) with a melting point of 60°C are dissolved in a mixture of 65 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a melting point of more than 300°C, and 15 parts by weight of xylol.

16. 15 parts by weight of gilsonite asphalt are melted, and a mixture is slowly added of 75 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of more than 300°C and of 10 parts by weight of methylene chloride, whereby an even solution results.

17. 50 parts by weight of tar oil, from which anthracene has been removed with a specific gravity of 1.0 and a boiling range of 250–350°C are emulsified with 3 parts by weight of oleate of sodium and 47 parts by weight of water heated to 90°C in a high speed agitator in the wellknown manner whereby the water forms the continuous phase.

18. 15 parts by weight of petroleum asphalt (high vacuum bitumen) with a melting point of 70°C (R. & B.) are dissolved in 45 parts by weight of tar oil with a specific gravity of 1.0 and a boiling range of 250–350°C. The solution is emulsified in the known manner in a colloid mill with 36.5 parts by weight of water heated to 90°C and 3.5 parts by weight of sulphite liquor used as an emulsifying agent. In this, emulsion water forms the continuous phase, while the asphalt oil solution forms the dispersed phase.

19. 95 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of 300°C are mixed with 5 parts by weight of an ester of fatty alcohol. When this mixture is poured into moist conduits or when it is mixed with water while stirring, an emulsion forms whereby the water represents the continuous phase. The mixing with water is possible in any proportion.

20. 30 parts by weight of petroleum asphalt with a melting point of 40°C (R. & B.) are dissolved in a mixture of 55 parts by weight of refined mineral oil (spindle oil) with a specific gravity of 0.89 and a boiling point of more than 300°C and 10 parts by weight of white spirit with a boiling range of 140–170°C. To this solution, 5 parts by weight of an ester of fatty alcohol is added under stirring whereby a product results which can be emulsified with water in any proportion.

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