

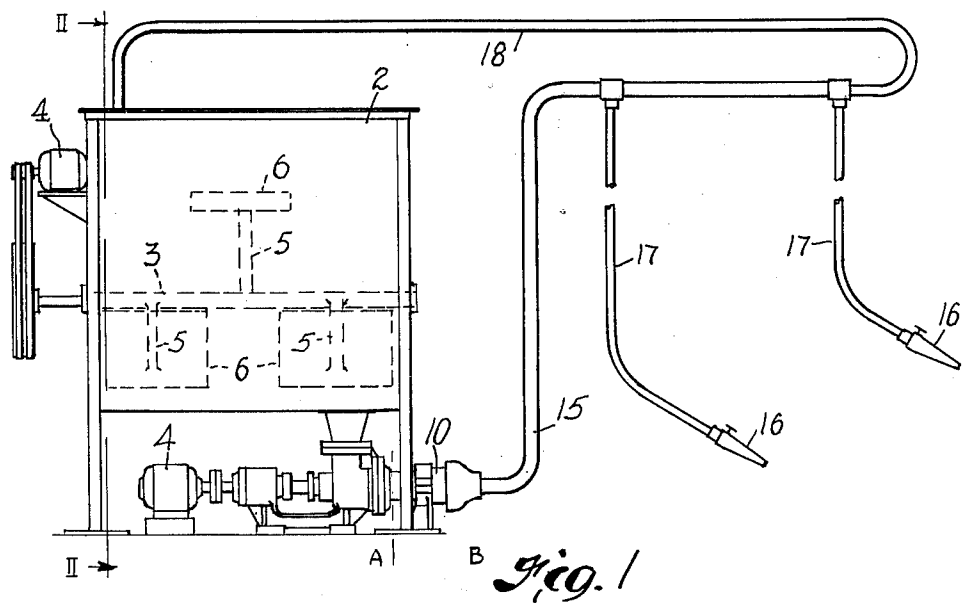
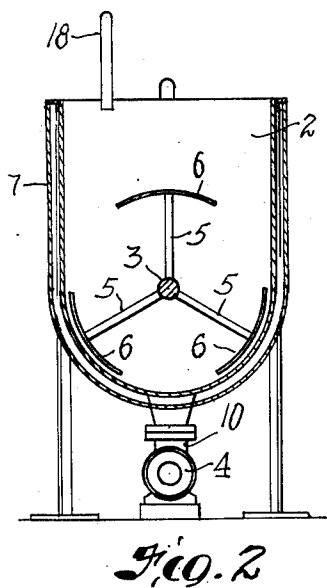
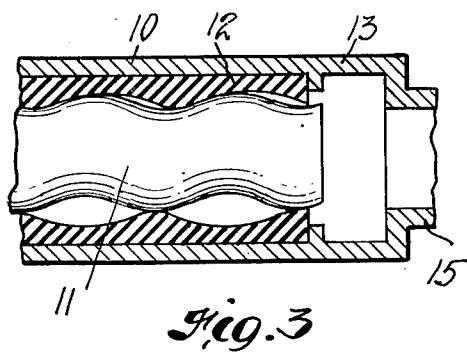
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ASPHALTIC-COMPOSITION APPLICATION

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ASPHALTIC-COMPOSITION APPLICATION

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Efforts have been made to form a layer of asphalt mastic compounds on sheet metal by troweling or doctoring into position. Compounds of this character are rather critical, in that they involve mixtures of finely divided mineral filler and asphaltic binder and a liquid, either a volatile solvent or water emulsion, and by reason of specific gravity differences there is considerable tendency for the mineral matter to settle out before application to the desired surface. Some attempts have been made to apply the compound by forcing it by compressed air through a flexible hose and a spray gun, but this has been handicapped by the plastic character of the material. Resort has been had accordingly to applying by barrel pump method in which the material is pumped directly from the shipping drum in which it is handled, by a piston type pump. Here again the heavy mineral matter has tended to settle such that stratification in the drum in which the material is shipped, has resulted in a thinner fluid at the top and an extra heavy mastic at the bottom of the drum, thereby causing non-uniformity. And, in such use of a reciprocating pump there has been an objectionable pulsation or irregularity in the stream of the material as attempted to be applied through a spray-gun type of device. Besides, the abrasive mineral matter has had the objection of quickly damaging such type of pump.

In the present invention, asphalt mastic with a high content of mineral filler may be successfully applied to metal surfaces in thickness as desired, and with minimal difficulty from the apparatus standpoint. Other objects and advantages of the invention will appear from the following description.

To the accomplishment of the foregoing and related ends, said invention then comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

Fig. 1 is a side elevational view of apparatus in accordance with the invention;

Fig. 2 is a sectional view taken on a plane substantially indicated by line II, Fig. 1; and

Fig. 3 is an axial fragmentary section between the dotted lines A and B, of Fig. 1.

In general, the form of compound involved is

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finely divided mineral and asphalt. The mineral matter may be ground asbestos, sand, limestone dust, silicate flour, mica, slate flour, asbestine, and the like. The proportion of mineral filler may be 25 to 75 per cent by weight. Advantageously there may be about 15 per cent of the asphalt binder together with other mineral powders as mentioned, the total of such asbestos and other mineral then being advantageously 40-65 per cent. The asphalt binder in general may have a softening point of 110-150, and penetration 20-120, and may be of steam reduced type, or steam vacuum type or semi-oxidized type. The asphalt mixture may involve in some cases a volatile solvent, and in others a water emulsion. Both types are thus composed of asphalt, mineral fillers, and liquid carrier. In the volatile solvent type, the asphalt is thinned with a naphtha such as rubber solvent naphtha, V. M. & P. naphtha, mineral spirits, etc., in general the initial boiling point being around 120-170° as in the rubber solvents or around 200 as in V. M. & P. and the end point in the case of rubber solvents may be around 220-270° F., or about 300° in case of V. M. & P. Various blends of solvents can be employed, the initial boiling point should not be above that of gasoline and the end point not above about 380°. The solvent is applied with the asphalt in the range generally of about 40 to 65 per cent by weight of asphalt and 35 to 60 per cent of solvent. In the emulsion type of compound, the asphalt is dispersed in water, the water being the continuous phase. Either the mechanically stabilized or the chemically stabilized form of emulsion may be employed. In the mechanically stabilized type, the dispersing medium, usually of clay or bentonite, and in the chemically stabilized type, a soap solution such as of rosin, tall oil soap, or alkaline agent such as trisodium phosphate, etc., are used as dispersing medium. Whether the solvent or water type of asphalt plastic compound is employed, it usually consists of 10 to 25 per cent of liquid carrier, 15 to 20 per cent of asphalt binder and 25 to 70 per cent of mineral fillers.

As seen, the high specific gravity of the mineral filler as compared with the rest of the composition, introduces a tendency to segregation, and in the present invention this is particularly dealt with such that the composition is supplied in uniformity at the point of application. And thus, in usages such as for sound-deadening in the automotive industries, satisfactory layers of uniform character may be had on portions of auto parts, such as interior surface of doors,

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trunks, quarter panels, tow boards and under surfaces of fenders, etc., to dampen vibration and to lessen noise. And similarly with such sheet metal porcelain-ware as sinks, tubs, cabinets, etc.; and in general with sheet metal surfaces.

In order to uniformize the asphaltic and mineral compound, as customarily available in shipping drums or metal barrels, the drums are dumped into an agitating zone, and the material thence is kept in motion to its point of application, and with avoidance of centrifugal force at any point to favor segregational separation. Furthermore, this kind of material is thixotropic. In a state of quiescence it is quite firm, but it becomes thinner on proper agitation. Thus, the material as received in the drums for instance is first introduced into a mixer 2, and preferably this is of pug mill type, such form of structure being especially well suited for uniformizing and handling the mastic or pasty material concerned. In the form illustrated, the mixer may have a shaft 3 driven by suitable means, for instance a motor 4, and carried on the shaft are arms 5 which carry blades 6, which may be of arcuate form to move under and lift the material in its general stirring action. Desirably, the agitating chamber may have a temperature-control jacket, such as steam jacket 7. Ordinarily, the asphalt mastic should be applied at a temperature of 60-90° F., and if the material as received in the shipping drums is outside such range, the temperature may thus be adjusted to desired point by the temperature-control jacket. The agitating zone 2 discharges into a further zone 10 in which there is a rotor 11 of sinuous or rounded helical form presenting gentle undulating surfaces, which by reason of the general screw-character agitate the material and forward it at the same time. Co-acting with the rotor is a stator lining or sleeve 12 in the casing 13, and a peculiarity is that the shaping of the interior surface of the stator involves a successive series of constrictions and expansions, thus in cooperation with the motion of the rotor providing a progression-succession of cavitation action, the material passing through points of constriction into zones of expansion. Liquefaction of the thixotropic material is further favored by this action and maintained in thorough agitation and it is forwarded to point of application. The stator portion 12 is also peculiar in being formed of resilient material, such as synthetic rubber which is not affected by asphalt. There is thus sufficient effective contact at points between the rotor and stator to favor sealing against back-slip of material, and allow ample cavitation for the material to rush into, and at the same time such surfaces are not detrimentally affected by the highly abrasive mineral particles. A conduit 15 directs the stream of material to point of application, and conveniently this may involve spray guns 16 of ample size, on the lines of hand-trigger controlled nozzles available. Such nozzles may be connected to the conduit 15 by flexible hose 17. The material is maintained in active circulation throughout. The conduit, in reduced size, beyond the point of sprayer connection, has a return section 18 leading back to the agitating zone 2.

In some cases, if it is desired, some addition of solvent may be introduced at the agitating zone 2, but in any event the material is here thoroughly uniformized, and the effective agita-

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tion is carried through in its transit to the point of application, especially by the progression-cavitating in the tubular passageway 12. And whether the material is freshly made up or may have been stored in drums for a considerable time with resultant segregation and settling together with stiffening, the asphaltic mastic is thoroughly uniformized and in such condition supplied at point of application.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims or the equivalent of such be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In the application of materials having a tendency to settle out comprising a uniform mixture of fluent asphalt of penetration 20-120 and inert mineral particles with higher specific gravities than said fluent asphalt, as deadener layers on metal surfaces and the like, the process which comprises the steps of introducing the uniform mixture into a confined stream, and passing the mixture in the confined stream and while it is in said stream, subjecting it to alternate successive compression and expansion, said expansion effecting cavitation in the stream whereby the uniformity of the mixture is maintained in the stream, and spreading the mixture on a metal surface.

2. In the application of materials having a tendency to settle out comprising a mixture of fluent asphalt of penetration 20-120 and inert mineral particles with higher specific gravities than said fluent asphalt, as deadener layers on metal surfaces and the like, the process which comprises the steps of subjecting the mixture to non-centrifugal agitation, and passing the mixture in a confined stream and while it is in said stream, subjecting it to alternate successive compression and expansion, said expansion effecting cavitation in the stream whereby the uniformity of the mixture is maintained in the stream, and spreading the mixture on a metal surface.

3. In the application of materials having a tendency to settle out comprising a mixture of fluent asphalt of penetration 20-120 and inert mineral particles with higher specific gravities than said fluid asphalt, as deadener layers on metal surfaces and the like, the process which comprises the steps of subjecting the mixture to non-centrifugal agitation, and passing the mixture in a confined stream and while it is in said stream, subjecting it to alternate successive compression and expansion, said expansion effecting cavitation in the stream whereby the uniformity of the mixture is maintained in the stream, and spreading the mixture on a metal surface while re-circulating the unused mixture back to the zone of agitation.

4. In the application of materials having a tendency to settle out comprising a uniform mixture of fluent asphalt of penetration 20-120 and inert mineral particles with higher specific gravities than said fluent asphalt, as deadener layers on metal surfaces and the like, the process which comprises the steps of introducing the uniform mixture into a confined stream, and passing the mixture in the confined stream and while it is in said stream, subjecting it to alternate successive compression and expansion, said expansion effecting cavitation in the stream whereby the uniformity of the mixture is maintained in

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the stream, and spray-applying the mixture onto a metal surface.

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