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COLD MIX AND COLD LAID BITUMINOUS
PAVING MIXTURE

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4 Claims. (Cl. 106—31)

This invention relates to improvements in bituminous paving mixtures and process of making same and refers particularly to a combination of an asphaltic material, priming oil and crushed stone.

The use and preparation of paving mixtures of powdered asphalt in combination with liquid or partially liquid priming oils and mineral aggregate are well known. Various methods are used of incorporating priming oil and asphalt, the basis of which is the balancing out of quantities of priming oil to powdered asphalt, so that when the two combine by slow solution under pressure, it results in an asphalt binder of required consistency. This invariably requires at least 50% of liquid priming oil and 50% of asphalt powder. If the priming oil is of very low viscosity, say below 500 seconds at 122° F. Furol, it is impossible to hold it in the mixture without running out before it has had a chance to thicken by the addition of the powdered asphalt. Where paving mixtures are required with a considerable lower consistency final binder than usual, the quantity of priming oil to powdered asphalt may be as high as 70% which requires an extra high viscosity oil to be able to hold it on the stone. Where a high viscosity oil is used, a slight preheating of the aggregate is required to be able to effectively mix it with the oil or it requires the thickening of the oil by the introduction of a solid binder portion exclusive of the powdered asphalt.

The use of thin priming oils has been proposed where fines and/or sand are present but as the thin priming oil is a very rapid solvent for the powdered asphalt which is added, the mixture thickens almost immediately to a point where it cannot be stored, trans-shipped and laid. This process, therefore, requires a very fine balance between the two products in regard to solvent power and very often results in mixtures that do not completely amalgamate as it is very difficult to maintain a substantial coating of the thin priming oil on the crushed stone aggregate due to its tendency to flow.

An object of this invention is to provide a process of producing bituminous paving materials containing the required amounts of mineral aggregate, priming oil and asphalt which may be prepared in its entirety at one central plant.

Other objects of the invention are as follows:
To provide a process of producing asphaltic paving material which will allow mixing easily and will be mobile during spreading.

To provide a process of manufacturing bitu-

minous paving materials in the cold, that is, at atmospheric temperatures.

Additional features of the invention will be apparent from the following description:

Predetermined quantities of priming oil, powdered asphalt and mineral aggregate are taken. The priming oil is divided into two parts and one part of the priming oil is mixed with all of the mineral aggregate. After mixing thoroughly to wet all of the mineral aggregate, all of the powdered asphalt is added and the mixture is mixed further to uniformly incorporate the powdered asphalt in the priming oil coating the mineral aggregate. The remaining part of the priming oil is then added and the mixing continued until the priming oil is uniformly dispersed over the first coating of priming oil containing the powdered asphalt.

Alternatively the first part of the priming oil and powdered asphalt may be added at the same time to the mineral aggregate by spraying the oil and powder upon the surfaces of mineral aggregate being mixed in a mixer.

The priming oil used in this process is an oil of low viscosity, 75 to 125 seconds at 122° F. Furol, and may be prepared from cracking coil tar reduced to this viscosity. The mineral aggregate may be of either predetermined grading or density or as it is found or produced at random. The asphalt used is one oxidized to 190° to 220° F. melting point though asphalts of higher melting points up to 350° F. may be used. The types of asphalts found preferable are those produced from cracking coil tar bottoms, Mexican crudes and California crudes.

The mixture is prepared without the application of heat and may be stored, shipped and spread as desired. The mixture is mobile even at low temperatures and is amalgamated by application of pressure after spreading in layers of the desired thickness.

The proportion of ingredients generally used is two parts of priming oil to one part of asphalt and the total amount of asphalt and priming oil added to a mineral aggregate is from 4 to 10% depending on fineness and penetration of the resulting paving mixture desired.

The advantages of this process are as follows:
Low viscosity priming oil may be used so as to obviate heating and to be able to utilize all types of mineral aggregate irrespective of fineness of particles or grading.

Highly mobile mixtures are prepared that can be handled at ordinary temperatures or even extreme low temperatures such as freezing.

Priming oil that has a high solvent power for the powdered asphalt may be used, as the presence of an external oil film insures mobility for a much longer time. This obviates the failures and difficulties that have occurred in using priming oils of retarded solubility.

Various changes and alternative procedures may be adopted within the scope of the appended claims, in which it is my intention to claim all novelty inherent in the invention as broadly as the prior art permits.

I claim:

1. Method of producing a cold mix and cold laid bituminous paving mixture using priming oils and powdered hard asphalts as thickeners, which comprises mixing a mineral aggregate with a priming oil, mixing the mineral aggregate and priming oil with powdered asphalt, and mixing the mineral aggregate, priming oil and powdered asphalt with a second quantity of priming oil.

2. Method of producing a cold mix and cold laid bituminous paving mixture using priming oils and powdered hard asphalts as thickeners, which comprises mixing a priming oil of a viscosity of 50 to 150 seconds at 122° F. Furol with a mineral

aggregate, mixing a powdered asphalt of 190° to 350° F. melting point with the mixture of mineral aggregate and priming oil, and mixing a second portion of the priming oil with the mixture of mineral aggregate, powdered asphalt and first quantity of priming oil.

3. Method of producing a cold mix and cold laid bituminous paving mixture using priming oil and powdered hard asphalt as thickeners, which comprises mixing the powdered asphalt, mineral aggregate, one-half of the priming oil, and mixing the remaining half of the priming oil with the mixture of powdered asphalt, mineral aggregate and one-half of the priming oil.

4. Method of producing a cold mix and cold laid bituminous pavement using priming oil and powdered asphalt as thickeners, which comprises wetting a mineral aggregate with a low viscosity priming oil, mixing the mineral aggregate with powdered hard asphalt, and wetting the mixture of mineral aggregate, priming oil and powdered hard asphalt with a second charge of low viscosity priming oil.

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