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ASPHALTIC MATERIAL AND METHOD OF PREPARING SAME

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The present invention relates to asphaltic materials and the novel methods by which the same are prepared, and is in some respects similar to the invention disclosed in my co-pending application Serial No. 97,767, filed on March 26, 1926.

One of the objects of this invention is identical with that of my former invention, namely, to provide an asphaltic shipping product which contains unblended asphalts in sufficient quantity to provide the necessary asphaltic cement when heated to the proper temperature for laying, and yet which will not pack when placed in a stock pile or in a vehicle for shipping.

My prior invention related to asphaltic materials for the construction of pavements for streets and road surfacing, whereas an object of this invention consists in the provision of an asphaltic material of relatively low cost which can be economically and advantageously employed in the lining of ditches, canals and reservoirs carrying water, placing a durable, waterproof protective surface on dikes or levees, and similar uses for the purpose of preventing the seepage and penetration of and erosion by the water as well as stopping all weed growth, as well as placing a comparatively thin resilient, waterproof asphaltic protective surface on concrete streets, sidewalks, factory floors, etc.

In my former product the mineral aggregate employed consisted of crushed stone, sand and filler, or sand and filler only, but in the product to be described and claimed herein, I employ earth or soil such as excavated from the ditch or the like being lined or other source of supply, it being necessary only that the same be free from roots or other vegetable or organic matter, and properly treated prior to the addition of the unblended asphalts.

As in the case of materials intended for road and street pavements the material intended for waterproofing is prepared at a central plant in such a manner as to prevent "packing" thereof while standing in the stock pile or during shipment and to which it is only necessary to apply heat at the time of spreading and rolling.

In the preparation of the shipping material the earth is thoroughly dried by heating at as low a temperature as possible to expel any contained moisture, passed through rolls to destroy any balls formed during the drying, screened to remove any roots or organic matter that may exist therein and then pulverized to such a fineness that 90% will pass a 30 mess sieve after which and while still warm one half of it is conducted to one compartment of the storage bin and the other half is allowed to cool in piles until it has attained atmospheric temperature after which it is conducted to a second compartment of the storage bin or it may be passed through a suitable cooling device and thence directly to the second compartment of the storage bin without being placed in piles. From the storage bin both the warm and the cool pulverized earth are drawn off separately into a weighing hopper discharging into a pug-mill or similar type of mixer.

Approximately one-half of the total amount of pulverized earth required to make a given size "batch" is drawn from the warm-earth compartment of the storage bin into the weighing hopper, discharged into the mixer and a predetermined amount of powdered hard asphalt is added and mixed thoroughly therewith; to this mixture is added a predetermined amount of semi-liquid asphalt or flux heated to complete fluidity and as soon as this has been thoroughly incorporated with the dry materials the balance of the pulverized earth required for the batch is added from the cool-earth compartment of the storage bin and mixed for about 30 seconds, thereby further cooling the mass and rendering it non-compacting. If greater toughness is desired in the finished protective surfacing from 1% to 5% of vegetable or mineral fibre such as shredded rags, jute, cotton, asbestos, or similar substance, may be added prior to the introduction of the semi-liquid asphalt or flux. The temperature of the pulverized earth at the time the other ingredients are added need not be held at any exact point but should be sufficiently high to prevent "balling" or nodulation of the flux com-

ponent and not high enough to cause blending of the hard asphalt and the semi-liquid asphalt or flux. As explained in my application referred to above this blending point depends upon the character of the hard asphalt used.

Owing to the greater total surface area of the particles comprising the "mineral aggregate" used and to their greater absorptive character more asphalt is necessary in a material designed for waterproofing protective purposes than in one designed for an asphaltic pavement, and owing to the function to be performed by the asphalt cement formed by the blending of the two asphalts when heated it must be tougher and softer than for ordinary pavement purposes. For these reasons more of both the powdered hard asphalt and the semi-liquid asphalt or flux are used and the proportion of the hard asphalt to the semi-liquid asphalt or flux is less in the waterproofing material than in the paving material. No exact percentage of total asphalt nor proportion of hard asphalt to soft can be given to suit every case, as these depend upon many factors such as the fineness and porosity of the particular earth used, the melting point of the hard asphalt and the consistency of the soft asphalt or flux, but as an example the component parts of a one ton batch might be as follows:

1720 lbs. (86.0%) pulverized earth.

70 lbs. (3.5%) Utah gilsonite, 310° F. melting point.

210 lbs. (10.5%) flux, 12/14.5 gravity.

The asphalt cement resulting from the blending of these asphalts would have a penetration of approximately 115 at 77° F. and would be suitable for a waterproof protective surface for the purposes mentioned.

The product as thus provided is a loose granular mass, which may remain in a stock pile for many months without "packing", and which likewise may be shipped in open freight cars or the like without any liability of its forcing into a cohesive mass difficult of unloading. Furthermore, the product is entirely self-contained in that it is ready for laying when its temperature is raised to a point which will cause the two asphalts to blend so as to provide the necessary quantity of asphalt cement.

From the foregoing description it will be apparent to those skilled in the art that I have devised an exceedingly simple method for producing a self-contained, non-packing asphaltic material; that the product is relatively inexpensive in manufacture, and is well adapted to the purpose of lining ditches, canals, and the like, as well as for providing a waterproof protective surface on dikes, levees, etc., as well as placing a resilient waterproof protective surface on concrete streets, sidewalks, floors, etc.

In accordance with the patent statutes I have described what I now believe to be the best embodiment of the invention but I do not wish to be understood thereby as limiting myself or the scope of the invention, as many changes and modifications may be made without departing from the spirit of the invention; all such I aim to include in the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The process of preparing for storage and shipment an asphaltic material suitable for lining ditches, canals and reservoirs or forming a waterproof protective surface on dikes and levees, or placing a resilient waterproof protective surface on concrete streets, sidewalks and floors, the asphalts of which are adapted to be converted to an asphalt cement on the job by blending, which comprises mixing hard asphalt in a powdered form insufficient in quantity to provide the required percentage of asphalt cement with a part of the dry pulverized earth required to make a given batch while warm, said mixing being carried out at a temperature below that at which the hard asphalt blends with a soft asphalt, adding semi-liquid asphalt or asphaltic flux to bind the powdered asphalt particles to the particles of earth, the quantity of semi-liquid asphalt or asphaltic flux being sufficient to provide the desired percentage of asphaltic cement when blended with the hard asphalt by heating, and then adding the balance of the dry, pulverized earth at atmospheric temperature, thereby cooling the mixture.

2. The process of preparing for storage and shipment an asphaltic material suitable for lining ditches, canals and reservoirs or forming a protective surface on dikes and levees, or placing a resilient waterproof protective surface on concrete streets, sidewalks and floors, the asphalts of which are adapted to be converted to an asphalt cement by blending on the job, which comprises drying, pulverizing and heating earth to a temperature below the point at which a powdered hard asphalt will blend with a semi-liquid asphalt or asphaltic flux, adding the powdered hard asphalt and a fibrous material to a part thereof, mixing the same and adding the semi-liquid asphalt or asphaltic flux, finally adding the balance of the pulverized earth required at atmospheric temperature.

3. The process of preparing for storage and shipment an asphaltic material suitable for lining ditches, canals and reservoirs or forming a protective surface on dikes and levees, or a resilient, waterproof protective surface for concrete streets, sidewalks and floors, the asphalts of which are adapted to be converted to an asphalt cement by blending on the job, which comprises drying, pulverizing and heating earth to a temperature

below the point at which a powdered hard asphalt will blend with a semi-liquid asphalt or asphaltic flux, adding the powdered hard asphalt and a fibrous material to approximately one-half of the requisite amount of pulverized earth while still warm, mixing the same and adding thereto the requisite amount of semi-liquid asphalt or flux heated to fluidity, then adding the balance of the pulverized earth cooled to atmospheric temperature and incorporating the same by an additional brief period of mixing.

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