

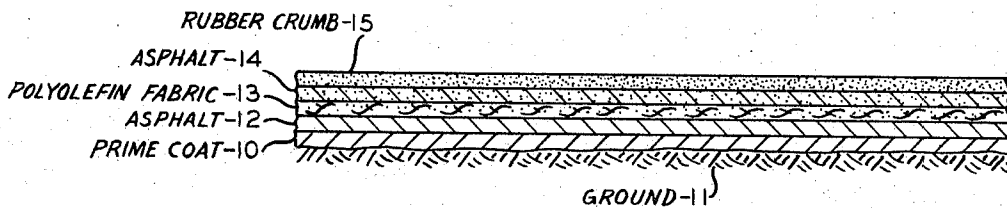
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H. L. DRAPER ET AL

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PREPARED SURFACE OF POLYOLEFIN FABRIC, ASPHALT AND RUBBER CRUMB

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BY

INVENTORS

D. F. LEVY
H. L. DRAPER
D. W. GAGLE

ATTORNEYS

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PREPARED SURFACE OF POLYOLEFIN FABRIC, ASPHALT AND RUBBER CRUMB

Homer L. Draper, Dale F. Levy, and Duane W. Gagle,
Bartlesville, Okla., assignors to Phillips Petroleum
Company, a corporation of Delaware

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4 Claims

ABSTRACT OF THE DISCLOSURE

A surface is prepared composed of asphalt, a polyolefin fabric and rubber crumb. The rubber crumb is atop the polyolefin fabric which is impregnated with the asphalt. In one method embodying the invention, a coating of asphalt is sprayed onto the place or area to be surfaced. Then a layer of a polypropylene fabric is placed into the freshly sprayed asphalt. A second coating of asphalt is sprayed onto the fabric following which rubber crumbs are distributed over the fresh asphalt at a rate of 3–6 pounds per square yard. The surface of the rubber is now covered with a partition agent such as talc or portland cement and the system then compacted with a roller to orient the rubber crumbs. A period of curing of approximately 4 to 8 hours is allowed and the area is then ready for service as on a playground, running track or protective covering.

SURFACE AND METHOD OF PREPARING THE SAME

This invention relates to a prepared surface. It also relates to the preparation of such a surface.

In one of its concepts the invention provides a prepared surface composed of asphalt, a polyolefin fabric and crumb rubber. In another of its concepts, the invention provides a method for preparing a surface composed, as stated, by laying asphalt upon an area, then setting a polyolefin fabric, e.g., polypropylene, into the asphalt, then covering the thus layed fabric with additional asphalt and finally covering with crumb rubber. In a further concept of the invention, the method provides for compacting, rolling, or pressing the crumb rubber together with the impregnated fabric. In a further concept of the invention, it provides for compacting the crumb rubber with aid of a partition agent placed thereon to facilitate the compacting and orienting of the crumb rubber during compacting.

It is known to treat a cotton fabric, cloth or fibrous material with an asphalt cut-back oil and to then spread sand on top of the thus treated fabric. It is also known to cover a fibrous fabric material with a good coating of asphalt and cut stone which is then rolled and finally given a top coat of asphalt. Further, it is known to prepare a preformed unit adapted for use in flooring or paving which includes a mixture of a plastic binder such as asphalt and reinforcing fibers of asbestos rag or the like and particles of stone or other anti-skid or wear-resisting materials imbedded in the base thereof. Further, it is known to imbed the anti-skid material in a suitable based material while under compression from all directions. Further, it is known to provide a foundation layer of a thermoresponsive material to which flakes of a pigmented thermoresponsive material are applied in random manner and bonded thereto.

It is an object of this invention to provide a surfacing. It is another object of this invention to provide a method for surfacing. It is a further object of this invention to provide a surfacing system possessing improved elasticity,

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improved cohesiveness, and improved wearing qualities. A still further object of the invention is to provide an anti-skid surface system for playgrounds, running tracks, athletic fields, driveways, runways or to protect other surfaces from the elements.

Other aspects, concepts and objects of the invention are apparent from a study of this disclosure, the drawing and the appended claims.

According to the present invention there is provided a prepared surface composed of asphalt, a polyolefin fabric and crumb rubber. Still according to the invention, there is provided a method for the preparation of a surface which comprises impregnating with an asphalt, a polyolefin fabric spreading crumb rubber upon the thus impregnated fabric and then pressing the crumb rubber against said impregnated fabric thus to orient and flatten the same to said surface.

In the drawing there is shown a cross-sectional view of the now preferred embodiment of the invention in which asphalt has been sprayed onto a place, a polypropylene fabric has been set into the asphalt, more asphalt has been sprayed onto the polypropylene fabric, crumb rubber at a rate in the approximate range of from 3 to 6 pounds per square yard has been added, the area has then been lightly dusted with talc and then rolled.

The polyolefin now preferred is polypropylene. A fabric now preferred is known as "Locktuft."¹ The fabric can be woven or nonwoven and can be composed of a mass of fibrils as obtained when fibrillating a polyolefin web.

We have found that polyolefin fabric, particularly polypropylene fabric as here described, which is a high density polypropylene, possesses the quality of binding together with the asphalt and with the crumb rubber to produce a durable, elastic, laminate system or surface which though it is made to yield, especially as the strata therebelow yields, will show good wearing qualities, including good cohesiveness.

Asphalts which can be used can be various. The asphalt ordinarily is used as a spray and suitably is in the form of an emulsion. In one form of the invention one layer of asphalt will be composed of cationic asphalt and another layer will be composed of anionic asphalt. This results in better bindings in some applications. Usually cationic asphalt emulsion is used. The physical properties of the asphalt will be adjusted to thoroughly wet the polyolefin fabric as well as the substrata. Further, the asphalt and the crumb rubber will be so selected as to yield good cohesiveness and cure, which can be assisted by radiant heating.

Thus, the crumb rubber can be compounded with additives causing it to meld with the asphalt and to form a continuum therewith. Included in the additives can be a vulcanizing agent which will vulcanize or further vulcanize the crumb rubber, as the case may be.

After compacting of the system upon the area upon which it is to be used or which it is to protect, there will be allowed usually a curing period, which depending upon the nature of the materials used may be of the order of several hours, say about 4 to about 8 hours.

As partition agents for the compacting, there may be used those agents which enhance the orienting of the crumb rubber particles. Such agents include talc, lime-stone dust, Portland cement, etc.

Depending upon the pressure of the compacting, the particles of crumb rubber will orient and will also flatten so as to provide a somewhat rough, yet continuous surface, as stated, having good wear qualities as well as resiliency.

The standard or conventional construction for playgrounds, driveways, etc., requires: 2 to 4 inches of

¹ Trademark.

crushed, graded, gravel laid on the ground; a prime coat about $\frac{1}{8}$ inch thick of such as a medium curing (MC) cut-back asphalt added thereto; and a top surface of 1 to 3 inches of asphaltic concrete.

The construction of this invention, for equivalent service, requires (see the figure): a prime coat **10** about $\frac{1}{8}$ inch thick of such as a medium curing (MC) cut-back asphalt applied to the ground **11**; a layer of cationic asphalt emulsion **12** applied in the amount of 0.2 to 0.5, usually 0.3, gallon per square yard of surface; the fabric **13**, about $\frac{1}{16}$ to $\frac{1}{8}$ inch thick "Locktuff" ²; a second layer of cationic asphalt emulsion **14** in the same quantity as above; and a layer of rubber crumb **15** ranging in size (shortest dimension) of about $\frac{1}{32}$ inch to (longest dimension) of about $\frac{1}{2}$ inch in the quantity of 3 to 6 pounds per square yard, usually about 4 pounds per square yard. Prior to rolling the surface, talc (such as about 100 to 400 mesh) is dusted over the surface of the construction in order to prevent pickup of materials by the roller.

Without the use of the rubber crumb, the coefficient of friction of the asphalt surface is too low for safe and proper usage. When using conventional stone chips to attempt to increase the coefficient of friction of the surface, an accidental fall results in cuts and abrasions, including severe "floor burn." With the rubber crumb, the coefficient of friction of the surface is so increased that slipping is substantially completely avoided, and an accidental fall causes no cuts, and rarely results in any "floor burn."

It has been found that the polypropylene fabric can hold up to about four times its weight of asphaltic materials, as compared with a felt paper, which holds only about twice its weight of asphalt, and with cotton or wool fabrics, which are poorer yet. Further, the paper, cotton fibers, and animal hair fibers tend to disintegrate in use. The polypropylene fabric does not disintegrate in use, since it is rot-resistant.

The crumb rubber which can be used to produce the surface system of the invention can be a synthetic butadiene-styrene crumb rubber containing carbon black. A typical crumb comprised seventy-five parts of butadiene, twenty-five parts styrene, and fifty parts of carbon black (by weight). Other known rubbers can be used. Also, there can be included in the rubber oil extenders, curing agents, vulcanizing agents, pigments, etc., depending upon the service to which the surface is to be exposed. The rubber particles are pressed or rolled (oriented) into the asphalt surface. In some operations, vulcanization is accelerated by application of radiant heat. In some applications, it is believed that there is a chemical union, in part, between

the asphalt and the rubber or components in the rubber. Also, it is found that rolling can cause the rubber to entangle or to intermesh with the fabric to result in a rigid holding of the rubber particles by the fabric, resulting in extra-long service of the system.

Reasonable variation and modification are possible within the scope of the foregoing disclosure, the drawing and the appended claims to the invention, the essence of which is that there has been provided a surfacing system composed of asphalt, a polyolefin fabric and crumb rubber; that a method has been supplied for preparing such a surface by applying asphalt to an area upon which the surface is to be prepared, setting a polyolefin fabric into the asphalt, assuring that the fabric is thoroughly impregnated with the asphalt and covering the same with crumb rubber which then is compacted and oriented onto the thus impregnated fabric; and that in a preferred embodiment of the invention, the fabric is composed of polypropylene.

We claim:

1. A prepared surface composed of an adherent mass of an asphalt, a polyolefin fabric and a crumb rubber, the asphalt being coated on the polyolefin fabric and the rubber adhering to the asphalt coating.

2. A surface according to claim 1 wherein the polyolefin fabric is impregnated with the asphalt and the crumb rubber is atop the impregnated fabric.

3. A surface according to claim 2 wherein the crumb rubber is oriented and flattened to the surface top.

4. A surface according to claim 3 wherein the polyolefin fabric is composed essentially of a polypropylene.

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WILLIAM D. MARTIN, Primary Examiner

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² Trademark.