Sept. 27, 1938. H. H. RINEHART 2,131,571

ANTISKID UNIT AND METHOD OF MAKING THE SAME

Filed Aug. 18, 1934

Fig. 1.

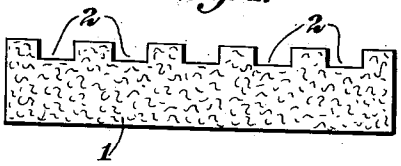


Fig. 2.



Fig. 3.

Fig. 4.

Fig. 6.

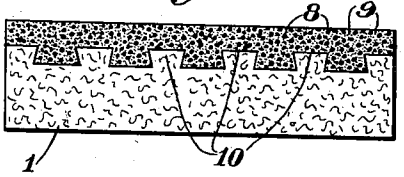
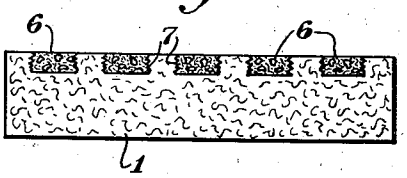


Fig. 5.



INVENTOR.
Harry H. Rinehart.
BY D. N. Halstead.
ATTORNEY.

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ANTISKID UNIT AND METHOD OF MAKING THE SAME

Harry H. Rinehart, New Market, N. J., assignor to Johns-Manville Corporation, New York, N. Y., a corporation of New York

Application August 18, 1934, Serial No. 740,429

2 Claims. (Cl. 94—5)

This invention relates to an antiskid unit and to the method of manufacturing the same.

There are in wide use, at this time, slabs of so-called asphalt plank comprising asphalt, reenforcing fibres of rag stock or asbestos, inorganic filler material such as cinders, and, suitably, also a limited proportion of finely divided filler of the type of whiting or diatomaceous earth.

Such slabs or planks, at ordinary temperatures, are very slightly yieldable under heavy loading and may be described as semirigid. They have the disadvantage of having a lower coefficient of friction than is desired, it being desired that the coefficient of friction should be substantially higher than that of smooth asphalt highway pavement.

It is an object of the present invention to provide an antiskid unit having as the base thereof conventional fibre-reenforced asphalt plank, of the type described, and having an adequate coefficient of friction to insure antiskid functions. Another object is to provide such a unit having antiskid material locked into the base material and exposed on the face of the unit. Another object of the invention is to provide such a unit in which the antiskid material is in continuous strips but is somewhat yieldable and, therefore, not susceptible to being cracked or broken when heavy traffic passes thereover. Other objects and advantages will appear from the detailed description that follows.

The units of the present type are adapted for use as traffic-bearing surfacing material, as in highway pavements, sidewalks, and flooring of factories.

Embodiments of the invention that are preferred at the present time will be described in connection with the drawing in which

Fig. 1 is an end view of a fibre-reenforced asphalt plank provided with closely spaced grooves and suitable for use as the base material;

Fig. 2 is a perspective view of a portion of a strip of material of high coefficient of friction adapted to be engaged in one of the said grooves;

Fig. 3 is a perspective view of a finished antiskid unit in which antiskid material of the type illustrated in Fig. 2 is disposed and locked within grooves in a base material initially of the type illustrated in Fig. 1;

Fig. 4 is a modified form of strip of antifriction material of irregular side edges.

Fig. 5 is an end view of a finished antiskid unit containing strips of friction material, of the type illustrated in Fig. 4, engaged in the grooves of a base material initially of type illustrated in Fig. 1; and

Fig. 6 is an end view of a modification of the invention in which antiskid material is disposed over the complete face of the unit and is locked in position in grooves in the base material.

There are shown units comprising base material 1 of the type of the fibre-reenforced asphalt slab or plank described.

Such base material may be made by a conventional process and from conventional ingredients in usual proportions. Thus, there may be formed an intimate, plastic, hot mixture of asphalt, shredded cotton rags, and cinders. The composition is made into a mixture, at an elevated temperature adapted to render the asphalt fluent, and is then extruded through a suitable orifice or between properly spaced rolls to form a slab that may be, for example, 2 inches thick and 8 inches wide and may be cut to a length of 8 feet.

The extrusion nozzle or equipment may be provided with means for forming in a face of the slab spaced grooves 2 that, as formed, may have vertical sides or may be wider at the bottom than at the top, as illustrated, for example, in Fig. 6. Alternatively, the slab formed initially into a rectangular unit of plane surface may be provided subsequently with grooves of the shape desired, as by means of saws or other cutting means.

After the grooved slab has been made, and, suitably, while it is still warm and the asphalt therein is in readily flowable condition, there is inserted in each of the grooves a strip 3 of antiskid material. This antiskid material should have a relatively high coefficient of friction and should be semirigid or somewhat yieldable, to avoid breaking under load applied to the face of the unit containing the said material. There may be used, for example, preformed strips of a highly compressed and then hardened composition of Portland cement, asbestos fibres, cinders, and water, this material being representative of a fibre-reenforced cementitious composition in set form and having a high coefficient of friction.

The strips 3 may be chamfered, that is, narrower on the face 4 than on the back 5, in order to promote the subsequent locking of the strips in the grooves, as will be described.

After the strips 3 have been inserted into position in the corresponding grooves 2, the resulting composite product is die-pressed. In this operation pressure is exerted from all sides, preferably while the asphalt in the unit is in warm condition. The pressing may be done in a die having plates contacting with face and back and the four edges of the composite, whereby flowing of the asphalt into tight, conforming engagement with the strips 3 is obtained. The product is then hardened, as by being allowed to cool to atmospheric temperature.

Strips 6 of antiskid material having, for example, broken edges of irregular contour, providing irregularities including recesses 7, may be used in place of the strips 3 and inserted into grooves 2. The resulting composite may

then be compressed, as described above, to force the base material of the edges of the grooves into the recesses and thus lock the strips in position, as shown in Fig. 5.

The strips 3 and 6 are alike in having inferior portions of the side edges extending beyond superior portions, in certain localized areas at least. The antiskid material is locked in position by engagement of the base material above such projecting inferior portions, as, for example, in the recesses 7 or against chamfered edges of the strip 3.

Preferably, the antiskid material fills the grooves, the exposed surfaces of the strips being approximately flush with the wearing surface of the base 1.

To minimize breaking, as a long unit containing embedded rigid strips of antiskid material is caused to yield slightly, the antiskid material may be in the form of a plurality of short strips separated from each other by dividers or separators 11, as illustrated in Fig. 3. These dividers may be composed of conventional joint filler material, wood, or the like.

If desired, the strips may be composed of other materials of high coefficient of friction than that previously described. Thus, the said strips may consist of granules of coarse sand, fine gravel or a sand-gravel mixture and a binder of the type of an asphalt adhering the granules into a unit, the proportion of binder being suitably of the order of 10 parts by weight to 100 parts of total weight of the antiskid material.

Such a composition is shown, for instance, in Fig. 6. In the modification of the invention there shown, granules 8 such as fine gravel or the like are bonded by a binder 9 of the type of an asphalt into an antiskid material disposed within the grooves, as illustrated. Antiskid material of this nature may be applied to the grooves at an elevated temperature, adapted to render fluent the binder therein, and may be hardened in situ, as by cooling.

If desired, additional antiskid material may be disposed over the face of the unit and over the antiskid material filling the grooves, to give a continuous surface of antiskid material, as illustrated in Fig. 6. In such a case, the said additional antiskid material is firmly adhered to the base material at positions 10 and, also, to the antiskid material previously applied in the grooves. Thus, when the binder in the antifriction material is thermoplastic, the additional antiskid material may be applied over the surface at an elevated temperature adapted to render fluent the thermoplastic binder and cause adherence to the base material to which it is applied, suitably under the influence of pressure as by means of a pressure roll. The grooves in the base material shown in Fig. 6 provide means for locking the antiskid material in position as by being wider at the base than at the top of the groove. In such a structure, the antiskid material is so locked in position as not to be disengaged during even severe use, as, for example, by the tires of an automobile passing thereover and being subjected to strong braking action.

While various dimensions of units and strips may be made, I have found particularly satisfactory strips of antiskid material that are approximately one-fourth as thick as the overall thickness of the base material into which they are locked. Also, I have found satisfactory the use of the antiskid material in strips that are of the order of 0.5 to 1.5 inches wide at the exposed face and are closely spaced, say spaced apart at their edges by approximately the width of the individual strips, to expose about equal areas of material having low and high coefficients of friction, respectively.

While the invention has been illustrated by examples which include the insertion of preformed antiskid units into recesses, such as grooves, in the base material, it will be understood that, as heretofore pointed out, antiskid material in other conditions may be inserted in the recesses. Thus, antiskid material in plastic (flowable) condition may be used to fill the recesses such as the series of longitudinally extending grooves 2 and allowed to harden in situ. For example, I may form an asphalt plank of the type described, provided with recesses in the face portion thereof that is to be exposed during use, pour into the recesses a flowable antiskid composition adapted to be hardened into a rigid material, say, of the type of a concrete containing Portland cement, sand and fine gravel and then allow the antiskid composition to harden. If desired, the antiskid material may be applied while the base material or plank is warm and the asphalt therein is relatively soft and plastic. In such a case, the hardening of base material or plank and the antiskid material associated therewith may be undertaken simultaneously.

Before casting the cementitious antiskid material in the recesses, separators or dividers 11 of the type described may be first placed across the grooves at close intervals, as, for instance, 12 inches apart, and the several spaces of relatively short length thus formed between these members 11 filled with the cementitious composition. The members 11 at their upper surfaces should be approximately flush with the tops of the ridges between the recesses.

The term "grooves" is used herein to include any form of recess or indentation in the face portion of the slab adapted to receive and hold antiskid material.

The details that have been given are for the purpose of illustration, not restriction, and variations therefrom may be made within the scope of the appended claims.

What I claim is:

1. A unit, adapted for use as traffic-bearing surfacing material, comprising a preformed fibre-reenforced asphalt slab provided with closely spaced grooves in the face thereof that is to be exposed during use and antiskid material secured within the said grooves, the antiskid material comprising a semi-rigid fibre-reenforced cementitious composition in hardened condition, of high coefficient of friction, and in strip form.

2. In making a unit adapted for use as a traffic-bearing surfacing material, the method which comprises forming a warm fibre-reenforced asphalt slab provided with closely spaced grooves in a face thereof, disposing in the said grooves strips of semirigid antiskid material having inferior portions of the sides of the strips extending beyond superior portions thereof, and compressing the resulting composite product from all directions while the slab is maintained in warm condition, whereby the asphalt is caused to conform to the sides of the said strips and the strips are locked in position.

HARRY H. RINEHART.