Dec. 13, 1938. J. R. FORDYCE 2,139,816

HIGHWAY

Filed June 24, 1936

Fig. 1.

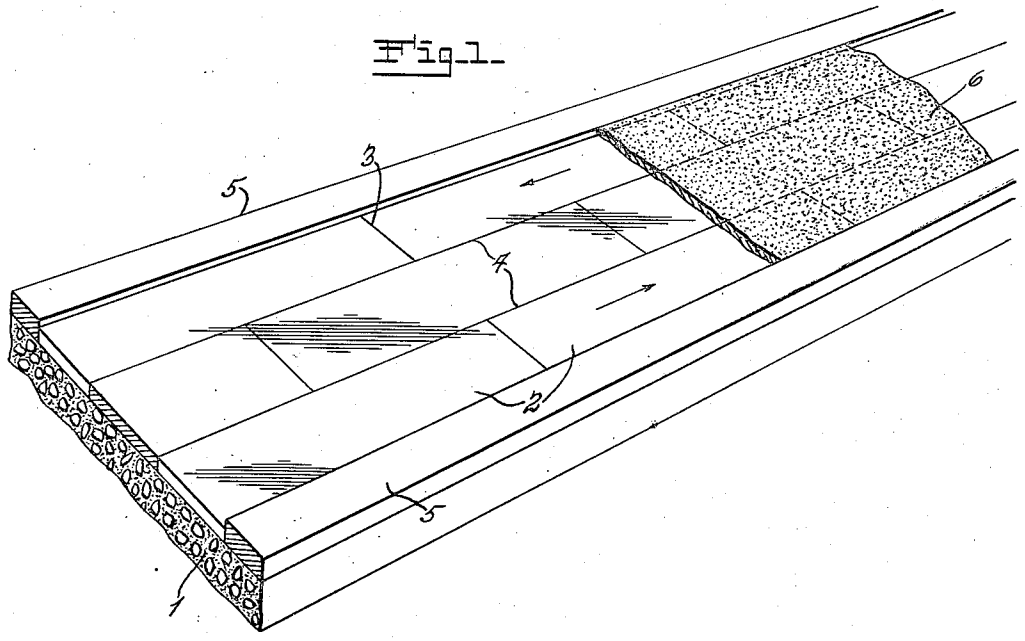


Fig. 2.

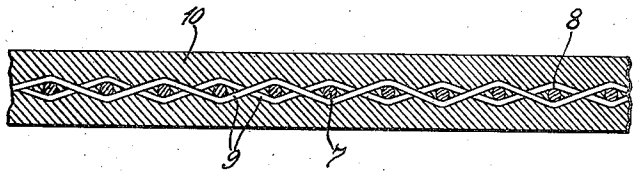
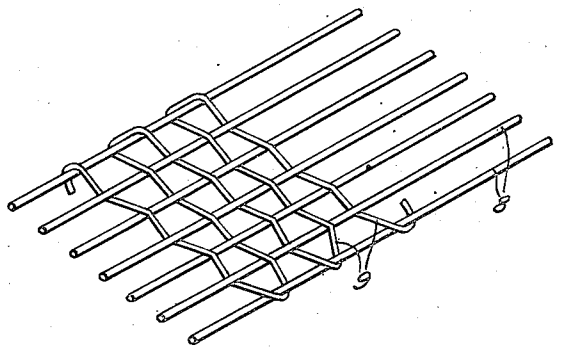


Fig. 3.



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Patented Dec. 13, 1938 2,139,816

UNITED STATES PATENT OFFICE

2,139,816

HIGHWAY

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Application June 24, 1936, Serial No. 86,944

3 Claims. (Cl. 94—7)

This invention relates, generally, to highways and particularly to a process of making highways and highway components.

In the making of highways, such as the familiar asphalt surfaced highways in accordance with the usual practice, it has been customary to apply over a suitable base an asphaltic covering composed, generally, of a mixture of aggregate, coarse or fine, with asphalt. In accordance with the usual practice, such surfacing of highways has been accomplished by applying either a coarse or fine mixture of aggregate and covering that with asphalt, or by applying a mixture of asphalt and aggregate directly to the base, and, thereafter, rolling, or otherwise compressing the surface produced in order to finish the same.

Such procedure of building up the highway structure in situ necessitates that the asphaltic highway material be heated and mixed near the point of application and then hauled out to be spread over the base. This not only necessitates the provision of mixing equipment in the immediate locality of the highway which is being constructed, but such procedure furthermore has the limitation that the work cannot be carried out except under appropriate weather conditions, and, accordingly, during a large percentage of the time the equipment and man power engaged in the mixing and laying of such highways are idle. Furthermore in the conventional practice of manufacturing the asphaltum aggregate surface in situ upon the highway base, uniform thickness of the asphalt and aggregate surface material is not obtainable due to unevenness in the surface of the base. This results in the occurrence of soft spots at the thick places and consequently after a relatively short period of use, holes and rough places in the highway frequently occur.

Moreover, the asphaltic surfacing material upon highways as now commonly employed is subject to creeping upon exposure to high temperatures and severe use with the result that a corrugated or washboard surface is produced, rendering the highway uncomfortable to traffic.

The object of the present invention, generally stated, is to provide a highway structure and the process of manufacturing components thereof, whereby the various disadvantages above mentioned in connection with the conventional asphaltic highway construction, may be substantially eliminated.

Another object of the present invention is to provide a highway in which the asphaltic covering is prefabricated.

A further object of the invention is to provide a highway in which the asphaltic covering is reenforced and laid in such manner as to permit the construction of such highways at greater economies and with greater conveniences than has been heretofore possible, as well as to produce highways having improved wearing and riding properties.

Other objects will become apparent to those skilled in the art when the following description is read in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a section of highway constructed in accordance with the present invention;

Figure 2 is a sectional view in end elevation of a component employed in the construction of highways in accordance with the present invention;

Figure 3 is a perspective view showing the arrangement of reenforcing material in highway components of Figure 2.

In accordance with the present invention, highways having asphaltic surfaces are provided with a surface or sub-surface composed of preformed mats or carpets. Such mats or carpets may be composed of a mixture of asphaltum and fine aggregate and in accordance with the present invention may be reenforced with a suitable material, such for instance, as a textile fabric or metal reenforcing net-work. In the laying of highways in accordance with the present invention a suitable base composed of crushed rock, stone or gravel may be provided in accordance with the usual practice. Directly upon this base may be laid a series of preformed mats or carpets in such manner as to cover the entire surface of the highway. These mats or carpets may be suitably bonded together and to the base, if desired, and in addition a wearing surface which may be so constituted as to reduce the liability of skidding when wet may be applied as a continuous layer over the surface formed by the series of preformed mats.

The preformed mats to which the present invention particularly relates may be formed of any suitable dimension but, for the sake of convenience, may be made of substantial size, such for instance as five feet to ten feet in width and fifty feet in length. It will be understood, of course, that depending upon the facilities provided for manufacturing and conveying such preformed mats any convenient size may be employed. Such mats may be manufactured at a central plant suitably enclosed so that the work may be carried on independent of weather conditions so that a continuous manufacturing season

is available. After the mats are actually constructed they may, of course, be stored and used when the need arises and other conditions demand.

In accordance with one embodiment of the present invention, such mats may be formed by embedding a suitable reenforcing material, such for instance, as open-work textile fabric which may be composed of cotton, jute, hemp, sisal, or any other vegetable materials found to be economical, practical and of sufficient strength. Moreover, metallic reenforcements may be employed in which case the reenforcement may be in the form of expanded metal, perforated sheets, wires, or cable woven together, if desired. In carrying out the invention a matrix composed of asphaltic material and fine aggregate, such for instance as loess or silica stone dust, may be spread over a reenforcing net-work, as for instance a textile fabric which has been previously dipped or treated with a suitable preserving compound, as for example asphalt solution. When a sufficient thickness of the asphaltum-aggregate matrix material has been applied, either on one or both sides of the reenforcing material, pressure may be applied as by tamping or rolling so as to thoroughly embed the reenforcing material in the asphaltum-aggregate matrix. These operations may conveniently be carried out upon a flat platform upon which the asphaltum-aggregate matrix material is spread over the reenforcing material, and, when a sufficient depth has been built up, the same may be rolled or tamped in order to reduce it to the desired thickness and density. This may then be left to cool at atmospheric temperature, or may be quickly cooled by deluging it with water. Such mats may, if necessary, be trimmed to the desired shape, but if the matrix material is suitably confined during the operations, it will be understood that mats of the desired dimension will result without the necessity of trimming.

Such reenforcing mats may then be applied to highways over a suitable base, as for instance, in accordance with the embodiment shown in the accompanying drawing and now to be described in detail.

As an illustrative embodiment of the present invention the highway may be composed of a suitable base **1** over the surface of which is laid a series of highway mats or carpets **2** constructed in accordance with the present invention. In the embodiment illustrated three courses of such mats are required to constitute the width of the highway and, as shown in the accompanying drawing, the mats of the respective courses are arranged to overlap the joints between the mats in adjacent courses. After the surface of the base has been covered with a suitable number of such mats the joints **3** between adjacent mats in the same course and the joints **4** between the respective courses may be bonded together by the application of molten asphalt at the joints. If desired before the mats **2** are laid upon the base a coating of molten asphalt may be applied thereto in order to secure the carpets to the base. In order to produce a smooth compact surface the mats as thus applied to the base may be rolled or suitably compressed.

Suitable arrangement may be provided at the edges of the highway for holding the mats against lateral displacement. For instance a continuous shoulder **5** extending along each side of the highway may be provided in accordance with the common practice.

While the surfaces of the mats themselves may be employed as the wearing surface of the highway, there may be advantageously applied thereover a continuous wearing surface having properties to reduce the liability of skidding during wet weather. Accordingly, a continuous coating **6** composed, for instance, of sized crushed rock or stone coated with asphaltic material may be applied thereover and suitably compressed to form a continuous surface.

In the embodiment shown in the accompanying drawing, the mats **2** are composed of a reenforcing net-work **7**, which, as hereinbefore pointed out, may advantageously be of textile fabric loosely woven so as to provide large interstices between the warp strands **8** and the weft strands **9** through which the asphaltum-aggregate material **10** may bond together securely embedding the reenforcing material **7** therein.

From the foregoing description, it will be apparent that the present invention accomplishes its objects and provides a highway, as well as a process of making the component parts thereof, and applying the same so as to enable the employment of a relatively large and economically operated plant which can be placed at a central point where the materials can be assembled and used in large quantities so as to enable more economic production of the mats. The present invention further permits the manufacture of such highway components at all seasons of the year and, consequently, an operative crew may be continuously employed in manufacturing the component mats at favorable prices because of the efficiency of large operations and reduced amount of labor needed to produce given quantities.

While in the foregoing description reference has been made particularly to the manufacture of the highway mats in an established plant which could be located at any convenient location, it is to be understood that such mats may be manufactured in close proximity to the site upon which they are to be applied. For example, suitable apparatus may be provided for manufacturing such preformed mats and discharging them in the form of continuous relatively long strips directly from the apparatus upon the highway which is to be surfaced. For example, this may be accomplished by providing an apparatus operative upon rails positioned one at each side of the highway to be surfaced so that the rails may also operate as a temporary retaining shoulder. The reenforcing material, particularly if it is in the form of textile reenforcement may be provided in the form of rolls so arranged as to be fed through a suitable apparatus for applying and compressing the asphaltum-aggregate matrix material about the reenforcement. By carrying out the process in this manner the mats may be discharged and laid directly upon the base of the highway while they are still warm and pliable, thus readily conforming to the surface of the base of the highway to such an extent that a single mat may extend across the entire width of the highway. Moreover, if the mat is relatively warm and pliable when discharged from such apparatus upon the highway base, the mat may bond itself to the base thus eliminating the necessity of applying the coating of bonding material to the base.

Since it is apparent from the foregoing description that various features of the present invention may be employed without reference to the other features and that modifications in the procedure hereinbefore specifically described may

be made without departing from the spirit of this invention, it is to be understood that the invention is not limited to the precise details of the embodiment hereinbefore specifically disclosed. It is to be understood, therefore, that such modifications and the use of such individual features and subcombinations of features as do not depart from the spirit of this invention are, although not specifically described herein, contemplated by and within the scope of the appended claims.

Having thus described the invention, what is claimed is:

1. In the art of making highways, the process comprising, preparing a highway base, forming carpets of reinforced asphaltum-aggregate having a width of at least about five feet and being relatively long, laying the preformed carpets over the entire surface of the base, anchoring the carpets in place, and applying a continuous surfacing layer to the laid carpets.

2. In the art of making highways, the process comprising, preparing a highway base, forming shoulders in the edges of the highway base, preparing formed carpets of reenforced asphaltum-aggregate having a width of at least about five feet and being relatively long, laying the preformed carpets over the entire surface of the highway base between the shoulders, and anchoring the carpets in place.

3. A highway comprising, a base, a series of preformed asphaltic mats having a width of at least about five feet overlying said base, said mats having a reenforcement embedded therein, and the mats being bonded together.

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