Jan. 30, 1934. K. E. McCONNAUGHAY 1,945,058

APPARATUS FOR PREPARING PAVING MATERIAL

Filed March 4, 1931

Fig. 1.

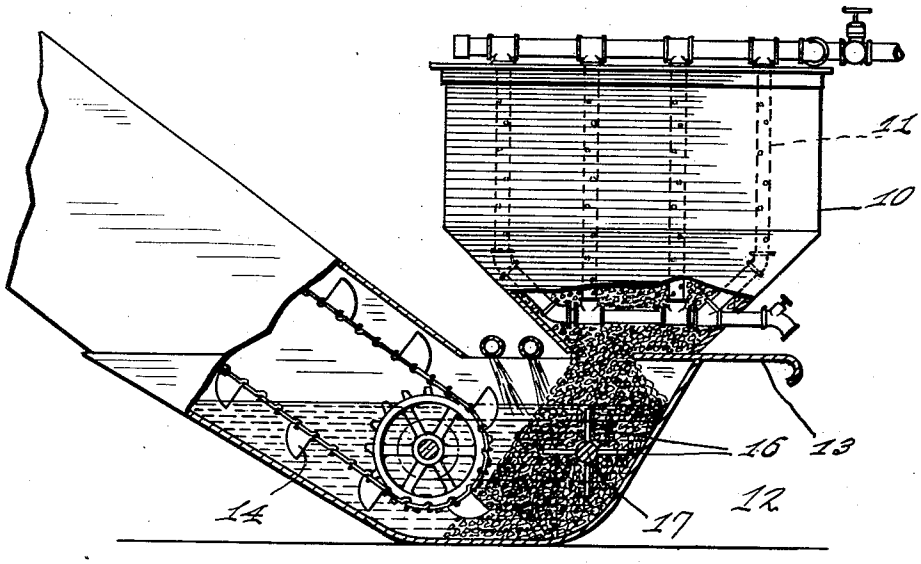
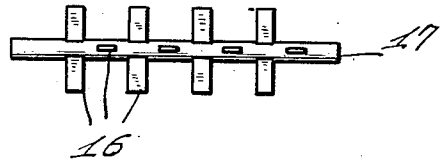


Fig. 2.



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APPARATUS FOR PREPARING PAVING MATERIAL

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Application March 4, 1931. Serial No. 519,993

9 Claims. (Cl. 94—43)

My invention is concerned with the preparation of bituminous paving material and, to an extent at least, is an improvement on the process and apparatus disclosed in my prior patent application Serial No. 511,051, filed Jan. 24, 1931.

In carrying out my invention disclosed in my prior application just referred to aggregate is immersed in a supply of liquefied bitumen and is then removed from the bitumen in such a manner and with such a means as to permit excess bitumen to drain from the aggregate. The means shown in my prior patent application for elevating the aggregate after the immersion in the liquefied bitumen is a bucket conveyor, the lower end of which dips into the vat which contains the binder. This process and apparatus is satisfactory in the main, but I have found that if the aggregate to be treated is composed of comparatively small particles or if small particles form an appreciable portion of the aggregate there is a tendency for such particles to "ball-up". That is, the finer aggregate particles collect and form balls the exterior surface of which becomes coated with binder, and the binder does not penetrate into the interior of the mass. This tendency of the finer aggregate particles to form balls is particularly evident when the aggregate is subjected to the action of heat and moisture just prior to its immersion in the binder, as in my prior application above referred to.

It is the object of my invention to prevent the finer aggregate particles from forming balls in the binder and to insure that substantially every particle receives a surface coating of the binder.

In carrying out my invention I provide in the vat which contains the liquefied binder an agitating means which is located between the point at which the aggregate enters the binder and the point at which it is picked up by the aggregate-elevating means.

The accompanying drawing illustrates my invention: Fig. 1 is a side elevation in partial section of an aggregate-treating apparatus, and Fig. 2 is an elevation of the agitator alone.

The device shown in the drawing comprises a hopper 10 adapted to contain a supply of aggregate. In the hopper 10 there are located a series of pipes 11 the walls of which are perforated. Steam supplied to these pipes by any convenient means (not shown) escapes through the perforations and warms and moistens the aggregate in the hopper 10.

The bituminous binder, which as set forth in my prior application above referred to is in the form of an emulsion, is contained in a vat 12 disposed below the hopper 10 in order that aggregate from the hopper may be discharged into the vat. To this end, the hopper may have an opening in its bottom wall, the effective size of such opening being controlled by an adjustable gate 13 to regulate the rate at which aggregate is discharged into the vat.

A bucket conveyor or other aggregate-elevating means 14 is arranged to pick up aggregate from the vat 12 and to elevate it through a casing 15 in which excess binder drains from the aggregate. As indicated in the drawing, the vat 12 preferably has a side wall which slopes downwardly from the aggregate-discharge opening of the hopper 10 toward the point at which the conveyor 14 picks up the aggregate.

Between the point at which the conveyor 14 picks up aggregate and the point at which the hopper 10 discharges into the vat, I mount in the vat agitating or stirring means which conveniently is in the form of a plurality of blades 16 projecting radially outward from a rotatable shaft 17, the shaft 17 being mounted to extend transversely of the vat 12 and parallel to the sloping side wall of the vat.

In the preferred arrangement, the shaft 17 rotates in a counter-clockwise direction (Fig. 1) so that the blades 16 may lift aggregate sliding down the inclined side wall of the vat 12. Preferably, the shaft 17 is so located that the blades 16 are always submerged in the binder which the vat 12 contains. Desirably, the shaft 17 rotates at a speed no more than sufficient to insure the breaking up of any masses of fine aggregate particles which enter the vat from the hopper 10. I have found a rotational speed of 50 to 60 revolutions per minute to be satisfactory in most cases.

When aggregate falls from the hopper 10 into the bin 12, it slides down the inclined side wall of the bin and is subjected to the action of the blades 16. These blades break up all masses of coagulated small aggregate particles both by their direct action on a coagulated mass and by lifting the mass and moving it through the binder. The agitation to which the aggregate is subjected by the action of the blades 16 results in a breaking up of any masses of fine aggregate particles and insures that each individual particle will obtain the desired coating of binder before it is elevated and removed from the binder by the bucket-conveyor 14.

I claim as my invention:

1. Apparatus for producing paving material, comprising a vat adapted to contain a supply of liquid binder, an aggregate hopper arranged

above said vat, said hopper being provided with a discharge opening through which aggregate may pass into said vat, conveying means for elevating aggregate from said vat, said conveying means being arranged to permit excess binder to drain from the aggregate, and aggregate-agitating means disposed in said vat between the point at which aggregate is discharged into said vat and the point at which said conveying means picks up the aggregate.

2. Apparatus for producing paving material, comprising a vat adapted to contain a supply of liquid binder, means for discharging aggregate into said vat, conveying means for elevating aggregate from said vat, said conveying means being arranged to permit excess binder to drain from the aggregate, and aggregate-agitating means disposed in said vat between the point at which aggregate is discharged into said vat and the point at which said conveying means picks up the aggregate.

3. Apparatus for producing paving material, comprising a vat adapted to contain a supply of liquid binder, an aggregate hopper arranged above said vat, said hopper being provided with a discharge opening through which aggregate may pass into said vat, conveying means for elevating aggregate from said vat, said conveying means being arranged to permit excess binder to drain from the aggregate, a rotatable member disposed in said vat between the point at which aggregate is discharged into said vat and the point at which said conveying means picks up the aggregate, and a plurality of aggregate-agitating blades extending outwardly from said rotatable member.

4. Apparatus for producing paving material, comprising a vat adapted to contain a supply of liquid binder, means for discharging aggregate into said vat, conveying means for elevating aggregate from said vat, said conveying means being arranged to permit excess binder to drain from the aggregate, a rotatable member disposed in said vat between the point at which aggregate is discharged into said vat and the point at which said conveying means picks up the aggregate, and a plurality of aggregate-agitating blades extending outwardly from said rotatable member.

5. The invention set forth in claim 1 with the addition of means for moistening aggregate before it enters said vat.

6. The invention set forth in claim 2 with the addition of means for moistening aggregate before it enters said vat.

7. A process for producing paving material comprising a mixture of aggregate with bitumen as a binder, comprising introducing aggregate into a bituminous bath at one point, removing the aggregate from the bath at another point and permitting excess bitumen to drain from the aggregate, and subjecting the aggregate to agitation during its passage from the point at which it enters the bath to the point from which it is removed therefrom.

8. A process for producing paving material comprising a mixture of aggregate with bitumen as a binder, comprising continuously introducing aggregate into a bituminous bath at one point, continuously removing the aggregate from the bath at another point and permitting excess bitumen to drain from the aggregate, and subjecting the aggregate during its passage from the point at which it enters the bath to the point from which it is removed therefrom.

9. Apparatus for producing paving material, comprising a vat having a horizontally extended bottom and adapted to contain a supply of liquid binder, means for discharging aggregate into said vat near one end of said vat-bottom, conveying means for elevating aggregate out of said vat from the other end of said bottom, said conveying means being arranged to permit excess binder to drain from the aggregate, and aggregate-agitating means disposed in said vat between the point at which aggregate is discharged into the vat and the point at which said conveying means picks up the aggregate.

KENNETH E. McCONNAUGHAY.