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2,030,683

ROAD SURFACE MIXER

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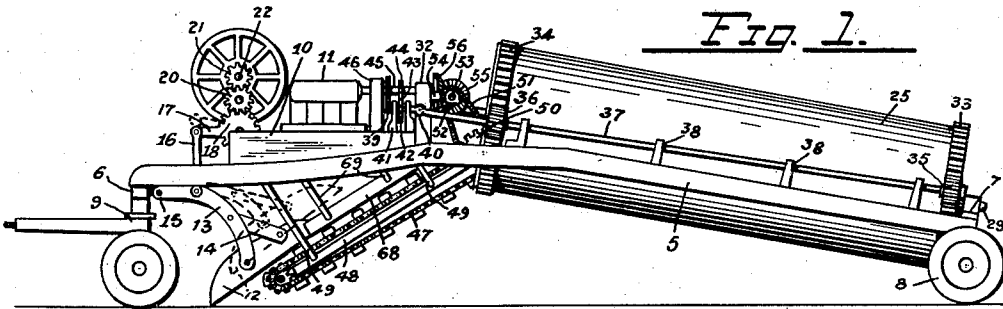


FIG. 1.

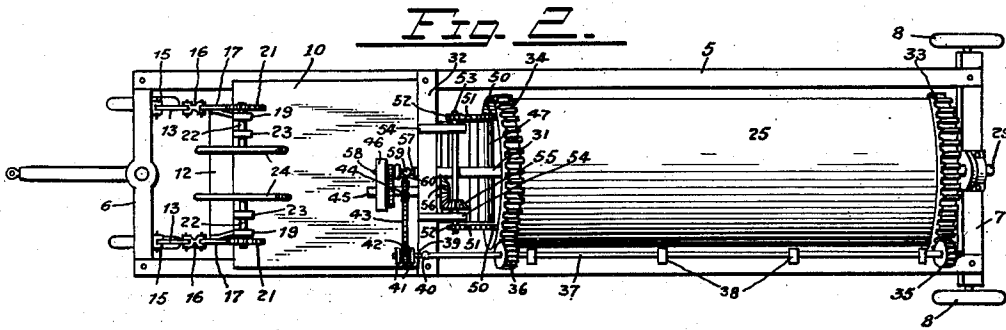


FIG. 2.

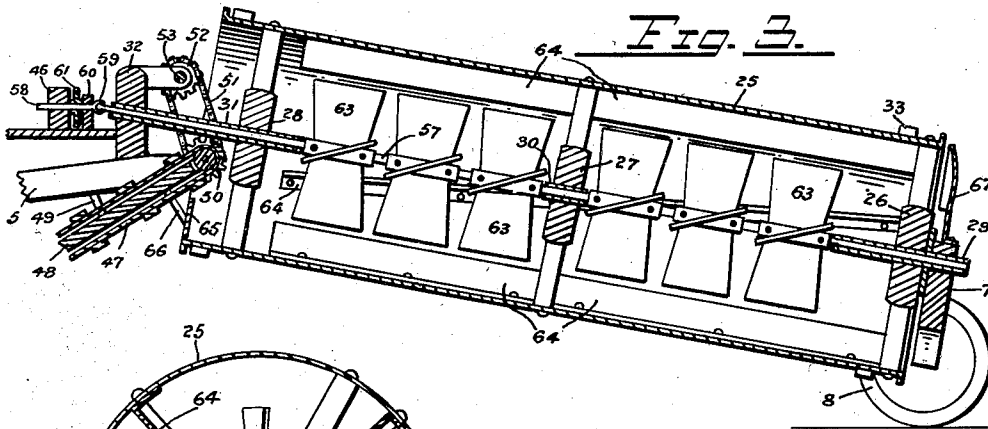


FIG. 3.

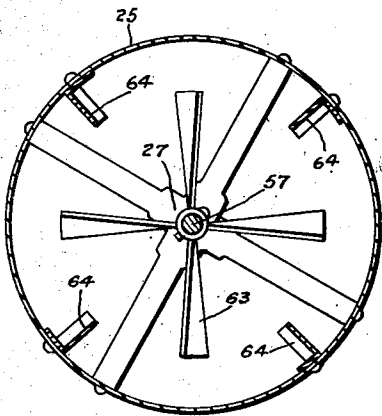


FIG. 4.

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ROAD SURFACE MIXER

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1 Claim. (Cl. 94-41)

My invention relates to road surface mixers and more particularly to an apparatus that is adapted to mix oil with road surfacing, such as gravel and the like. The primary objects of the invention are to provide a device of this character whereby the mixing of oil with road surfacing is thoroughly done in one operation thus effecting a large saving in time, labor and money. Heretofore the mixing of oil with road surfacing required a number of operations in going over the ground. By means of my device the road surfacing, after oil is applied thereto, is conveyed from the ground into a revolving cylinder having vanes mounted therein and rotating fans whereby the oil and surfacing is thoroughly mixed while it is passing through the cylinder. The apparatus is preferably pulled or towed over the ground and is supplied with a small engine for operating the conveyor belt, cylinder and the fans as will be fully hereinafter described.

With the above and other objects in view which will appear as the description proceeds, the invention consists of the novel construction, adaptation, combination and arrangement of parts hereinafter described and claimed. These objects are accomplished by devices illustrated in the accompanying drawing; wherein:

Figure 1 is a view in side elevation of the road surface mixer; Fig. 2 is a top plan view of the same; Fig. 3 is a view in longitudinal vertical section taken through the cylinder and associated parts; and Fig. 4 is a view in transverse vertical section taken through the cylinder.

Referring in detail to the drawing throughout which like reference numerals indicate like parts, the numeral 5 designates the side frame members of the mixer which members are held in spaced apart relation by a forward transverse member 6 and a rear transverse member 7. Said rear member is supported on an axle with wheels 8, while the forward member has a wheeled carriage 9 swiveled thereto and having a forwardly extending tongue by means of which the mixer is towed over a roadbed. A platform 10 is mounted on the forward portion of the frame and an engine 11, of any suitable size and design, may be mounted upon said platform.

A scoop 12 is mounted below the platform 10 in such manner that its forward edge is arranged to engage the roadbed slightly to the rear of the wheeled carriage 9. Said scoop is normally held in this position by an arcuate bracket 13 and a brace 14 secured to each of its sides, and the forward end of each bracket is pivoted to the forward transverse frame member 6 at 15. A rod

16 is pivoted to each of the brackets and extends upward to a pivotal connection with an arm 17 projecting from a spur gear 18. Each of said spur gears is mounted on a standard 19 fixed to the platform 10 and meshes with a pinion 20 also mounted on said standard. A gear 21 meshes with each pinion and each of said gears has a stub shaft 22 extending inwardly through the standard 19 and through another standard 23 mounted on the platform 10. The inner ends of each stub shaft has a hand wheel 24 fixed thereto and by turning both of said hand wheels it will be obvious that the scoop 12 is lifted free of the roadbed to the dotted position shown in Fig. 1 of the drawing. By turning only one of said hand wheels one side of the scoop is lifted which is sometimes desirable in turning corners and in passing over material deposited on the roadbed.

A large cylinder 25 has a rear cross brace 26, a central cross brace 27 and a forward cross brace 28 mounted therein, the arms of each cross brace being fixed to the wall of the cylinder. Sleeves 29, 30 and 31 are respectively fixed through the center of said cross braces. All three sleeves are in longitudinal alignment and are axially disposed with respect to the cylinder. The rear sleeve 29 is journaled through the rear transverse frame member 7, and the forward sleeve 31 is journaled through a stanchion 32 fixed transversely to the side frame members 5. As clearly shown in the drawing the cylinder 25 slants rearwardly and downwardly. Gear teeth 33 are provided around the rear end of said cylinder and gear teeth 34 are provided around its forward end. A pinion 35 meshes with the rear gear teeth and a pinion 36 meshes with the forward gear teeth. Said pinions are fixed on a side shaft 37 extending in parallel with the cylinder and supported by bearings 38 fixed on one of the side frame members 5. The forward end of the side shaft is connected to a short shaft 39 by means of a universal joint 40. The short shaft is journaled in standards 41 mounted on the platform 10 and has a sprocket wheel 42 fixed thereon. A sprocket chain 43 extends from said sprocket wheel to another sprocket wheel 44 fixed on a short shaft 45 supported by the stanchion 32 and by a standard 46 fixed on the platform 10. Said short shaft is connected to the main shaft of the engine 11 in any desired manner and it will be apparent from the foregoing described mechanism that said engine causes rotation of the cylinder 25.

A conveyor belt 47, mounted for rotary movement around a shelf 48, extends from a point

close to the bottom of the scoop 12 upwardly into the forward end of the cylinder 25, and is held in this position by side braces 49 connected to the shelf and to the side frame members 5. Said belt is provided with the usual transverse slats, end rollers, sprocket wheels and chains which will not be described in detail. Rotary movement of said conveyor belt is caused by a pair of sprocket wheels 50 fixed on the ends of its upper roller within the forward end of the cylinder and having sprocket chains 51 extending therefrom respectively to a pair of sprocket wheels 52 fixed on the ends of a transverse shaft 53. Said shaft is journaled in bracket arms 54 fixed to the transverse stanchion 32 and has a bevel gear 55 fixed thereon and in mesh with a bevel gear 56 which is fixed on the end of the short shaft 45 which shaft is connected to the shaft of the engine 11. It will thus be seen from the foregoing description that said engine causes rotary movement of the conveyor belt 47.

A long shaft 57 extends centrally through the cylinder 25 and through the sleeves 29, 30 and 31 which serve as bearings therefor. A stub shaft 58 is connected to the forward end of the long shaft by means of a universal joint 59. Said stub shaft is journaled through the standard 46 and through a small standard 60 mounted on the platform 10. A small spur gear 61 is fixed on said stub shaft and meshes with a large spur gear 62 fixed on the short shaft 45 that is connected to the shaft of the engine 11. It will therefore be evident that rotary movement of the engine shaft causes rapid rotary movement of the long shaft 57. A plurality of fans 63 is fixed to said long shaft between the sleeves 29, 30 and 31 within the cylinder 25. A plurality of vanes 64 is fixed to the inside of the cylinder 25. For the purpose of preventing any of the gravel from spilling out of the front end of the cylinder, a transverse plate 65 may be positioned in the lower portion of its forward end by means of braces 66 connected to the shelf 48, and a shield 67 may be connected to the rear transverse frame member 7 and extend upward to prevent gravel from being blown out of the rear end of the cylinder, as clearly shown in Fig. 3 of the drawing. Guard plates 68 may also be mounted close to the sides of the conveyor belt 47 by means of braces 69 connected to the side frame members 5 as shown in Fig. 1 for preventing gravel from falling off the conveyor belt as will be understood.

In the practical use of my road surface mixer, oil is first applied to the loose gravel or the like on the ground and the gravel is then scraped up in the form of a ridge extending along the roadbed. The engine 11 is started and the device is towed or otherwise moved along the road with its scoop 12 engaging the ridge of gravel. The gravel is thus forced upwardly over the scoop

and upon the conveyor belt 47 which conveys it into the revolving cylinder 25. The vanes 64 lift the gravel upwardly and drop it upon the rapidly revolving fans 63 which mix every particle of the oil and gravel together during its movement through the downwardly slanting cylinder. After the mixture is deposited from the rear end of the cylinder it is spread evenly over the roadbed and rolled to form a hard surface. To form a hard surface it is important that the oil should cover every particle of the gravel. The piece meal means heretofore employed to form a thorough mixture lacks efficiency and requires much time and labor. It is conservatively estimated that this work can be done eight times as fast by means of the mixer herein described.

While the device has been described somewhat in detail, it will be understood that many of the details may be changed without departing from the scope and spirit of the invention. The device herein shown and described is intended merely as an illustration of one means whereby the principles of the invention may be reduced to practice. The essential novel features of the invention reside broadly in the slanting and revolving cylinder with rotary fans and vanes therein, and its combination with a conveyor belt and a scoop, and it is manifest that these features may be considerably altered within the scope of the invention. If desired, the engine 11 may be arranged to propel the device over the ground by making the necessary connection and supplying the necessary steering apparatus.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

In a road surface mixer, the combination of a longitudinal frame, wheels supporting the frame, a cylinder open at both ends, mounted for rotary movement longitudinally upon the frame, a plurality of vanes fixed longitudinally to the inside of the cylinder, a plurality of fans mounted for rotary motion within the cylinder, said cylinder slanting downwardly from its forward to its rear end, a conveyor belt supported by the frame and extending in a slanting direction upwardly and directly into the forward end of the cylinder, a scoop supported by the frame immediately forward of the conveyor belt, and means for causing rotary movement of the conveyor belt, cylinder and fans, whereby road surfacing material is scooped up from the ground by the scoop when the mixer is moved over the ground and conveyed directly into the forward open end of the cylinder by the conveyor belt where it is elevated by the vanes within the revolving cylinder, dropped onto the revolving fans, mixed thereby and moved to the open rear end of said revolving and slanting cylinder where it is deposited back upon the ground.

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