Dec. 12, 1933. L. SWEARINGEN 1,938,755

MACHINE FOR REFINISHING ROADS

Filed April 18, 1932 4 Sheets-Sheet 1

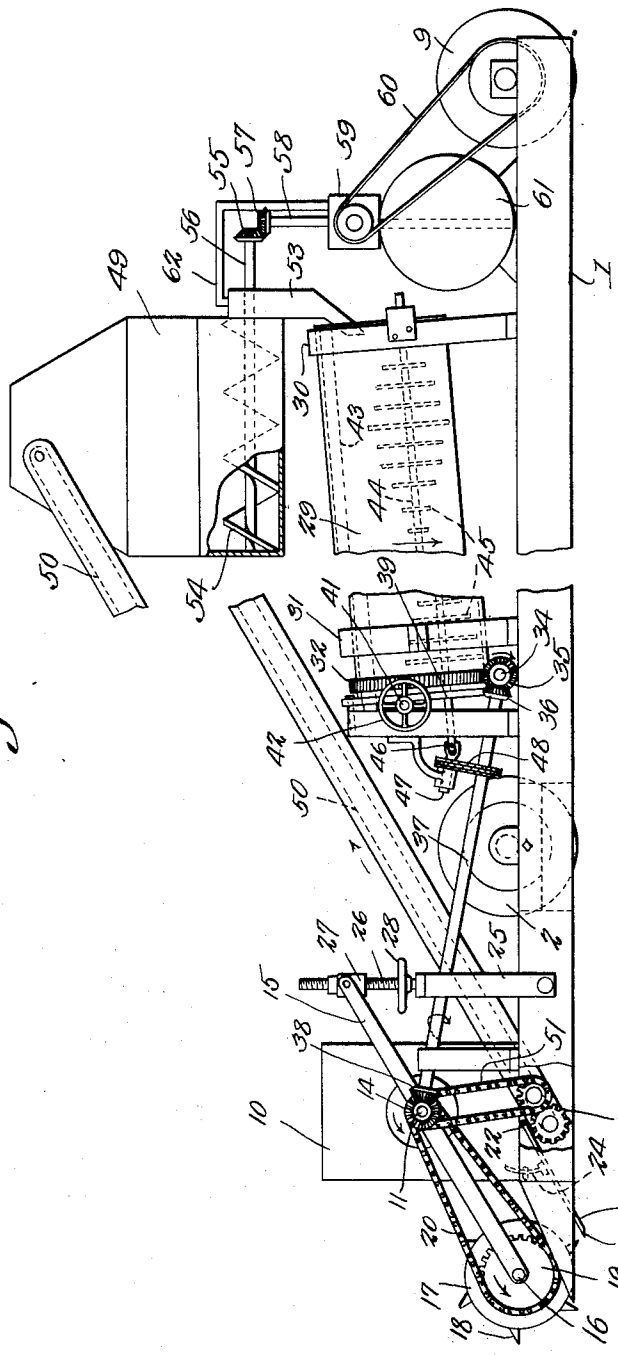


Fig. 1.

Inventor

Lee Swearingen

By Chas. Thompson Co.

Attorneys

Dec. 12, 1933. L. SWEARINGEN 1,938,755

MACHINE FOR REFINISHING ROADS

Filed April 18, 1932 4 Sheets-Sheet 2

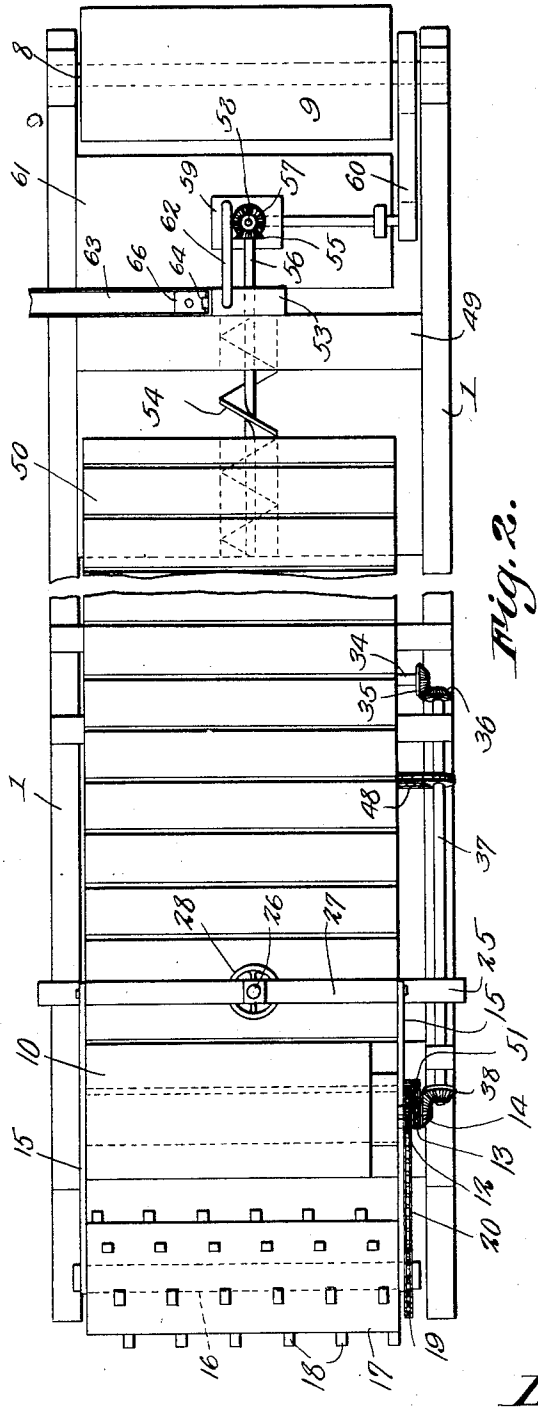


Fig. 2.

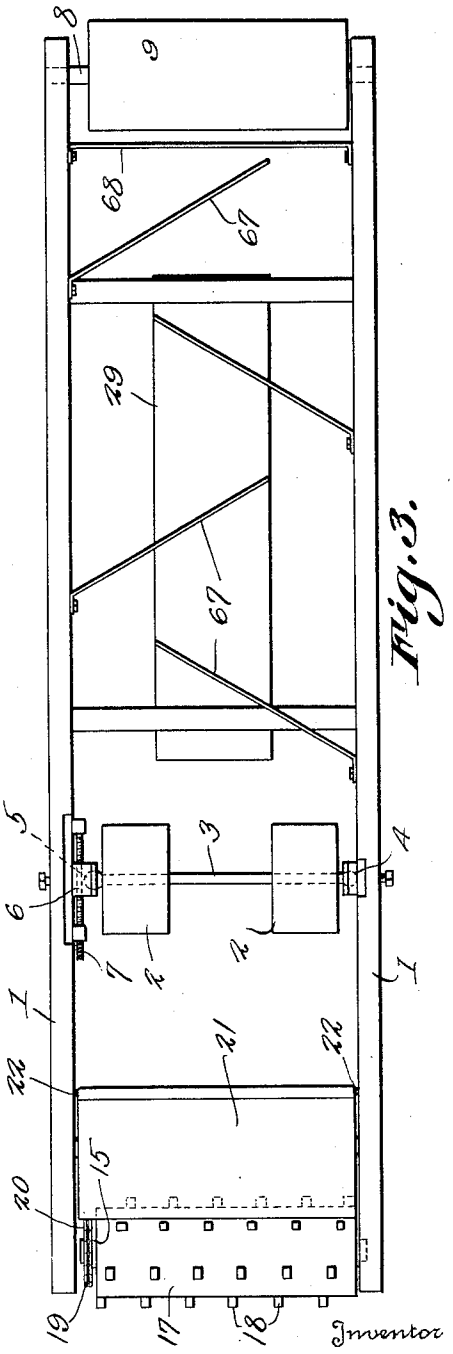


Fig. 3.

Inventor

Lee Swearingen

By C. A. Snow & Co.

Attorneys.

Dec. 12, 1933. L. SWEARINGEN 1,938,755

MACHINE FOR REFINISHING ROADS

Filed April 18, 1932 4 Sheets-Sheet 3

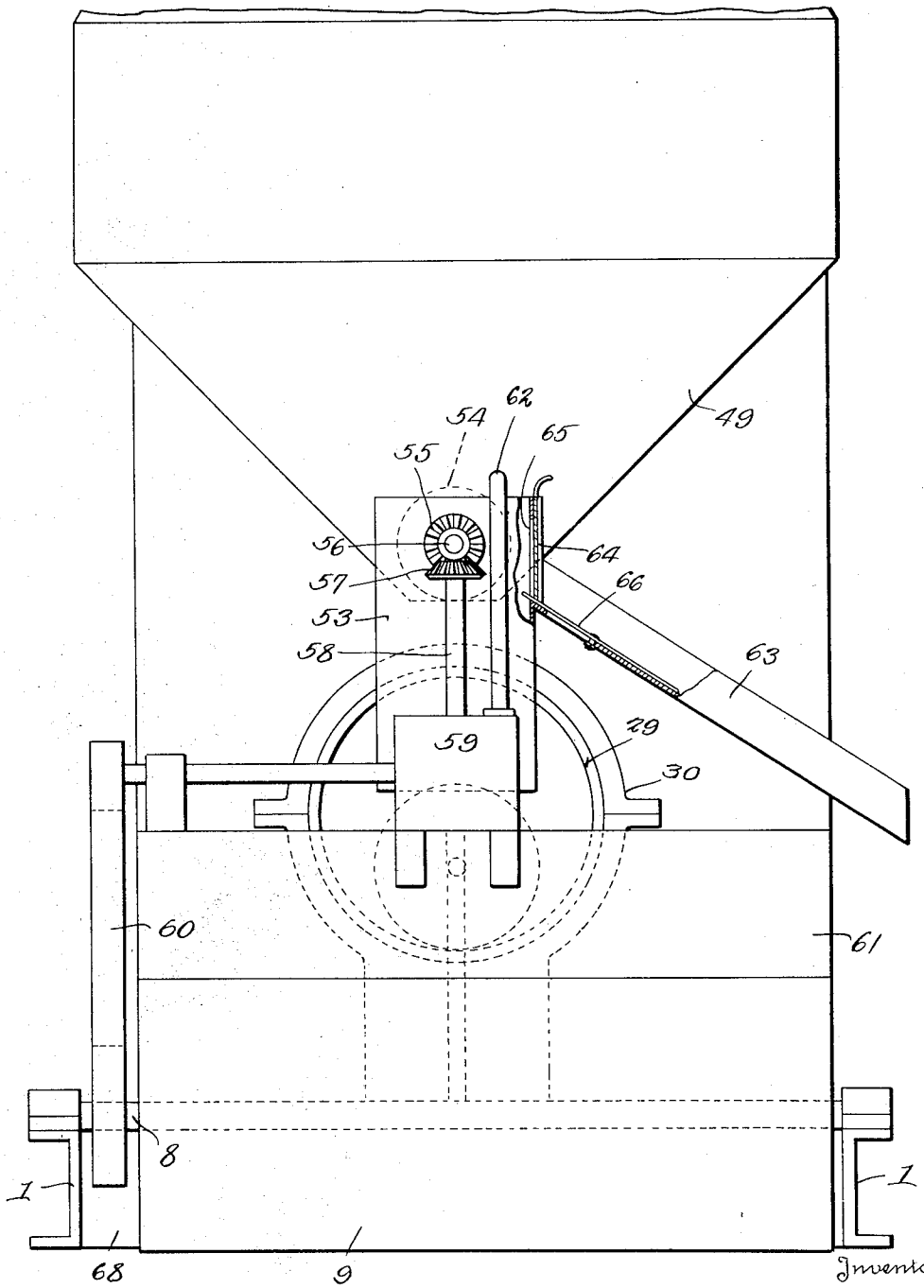


Fig. 4.

Inventor

Lee Swearingen

By C. A. Snow & Co.

Attorneys.

Dec. 12, 1933. L. SWEARINGEN 1,938,755

MACHINE FOR REFINISHING ROADS

Filed April 18, 1932 4 Sheets-Sheet 4

Fig. 5.

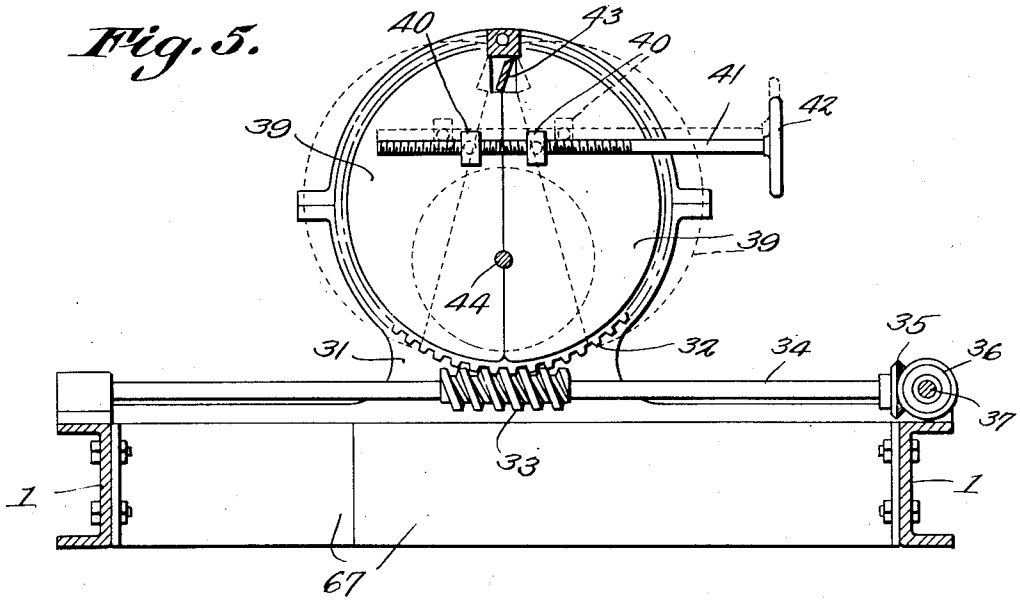
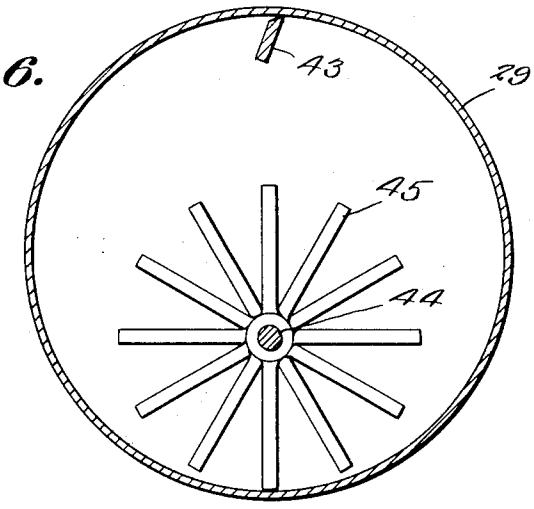


Fig. 6.



Inventor

Lee Swearingen

By C. A. Snow & Co.

Attorneys.

Patented Dec. 12, 1933 1,938,755

UNITED STATES PATENT OFFICE

1,938,755

MACHINE FOR REFINISHING ROADS

Lee Swearingen, Bakersfield, Calif.

Application April 18, 1932. Serial No. 605,957

1 Claim. (Cl. 94—43)

This invention relates to a machine for resurfacing roads having top surfaces of dirt, gravel, macadam, or like materials.

It is an object of the invention to provide a single apparatus which, when propelled over a road, will operate to loosen the surface material to a uniform depth, elevate the loosened material to a mixer where it is commingled with oil or any other suitable binder, after which it is deposited on the road, spread evenly and rolled so as to leave a smooth, well-finished surface, all of the foregoing operations being effected by the one machine.

With the foregoing and other objects in view which will appear as the description proceeds the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is a side elevation of the complete machine, parts being broken away.

Figure 2 is a top plan view, parts being broken away.

Figure 3 is a bottom plan view on a reduced scale, parts being removed.

Figure 4 is a rear elevation, the lateral discharge chute being shown partly in section.

Figure 5 is a transverse section showing the gate at the outlet end of the mixer and the means for operating it and the mixer.

Figure 6 is a transverse section through the mixer.

Referring to the figures by characters of reference, 1 designates the side beams of a rigid body or main frame, these beams being supported near one end by spaced wheels in the form of rollers 2 supporting an axle 3 which is angularly adjustable in any manner. For example, one end of the axle can be provided with a universal bearing 4 connected to one side beam while the other end can be provided with a universal bearing 5 in a box 6 having means for adjusting it longitudinally of the adjacent beam 1. One such means is an adjusting screw 7 supported by the beam 1 and rotatable to move the box 6 forwardly or rearwardly. By utilizing any desired means for actuating the screw 7 the axle 3 can be shifted to steer the machine. Obviously any suitable means may be employed for raising and lowering the frame relative to the axle. Such means are so well known that it is not deemed necessary to show or describe the same. It might be stated, however, that the means for supporting the screw 7 could be carried by a vertically adjustable slide on one beam while the bearing 4 could be carried by a vertically adjusted slide on the other beam.

The rear end of the frame has a transverse axle 8 mounted thereon, this axle being supported by a roller 9.

An engine 10 is located adjacent to the front end of the frame and has a shaft 11 carrying sprockets 12 and 13 and a gear 14. Side arms 15 are fulcrumed between their ends on this shaft and are normally inclined downwardly and forwardly. Their forward ends support a shaft 16 on which is mounted a scarifying cylinder 17 having spaced peripheral teeth 18. A sprocket 19 rotates with this cylinder and receives motion from sprocket 12 through a chain 20.

An apron 21 is fulcrumed in the frame back of the scarifier, as shown at 22, and is inclined downwardly and forwardly to a sharp front edge 23 located close to the path of the teeth of the scarifier. This apron can be adjusted angularly so as to project any desired distance below the frame formed by beams 1 and it can be fastened in adjusted position by clamping an arm 24 upstanding from the apron.

A yoke 25 extends across the frame and is pivotally mounted thereon. This yoke has an adjusting screw 26 extending upwardly therefrom and engaging a cross bar 27 to which the arms 15 are pivotally connected. The screw can be rotated by wheel 28 or the like for the purpose of raising or lowering the cross bar and thereby shifting arms 15 to lower or raise the scarifier. This adjustment can, of course, take place without affecting the drive connections on shaft 11.

A mixing cylinder 29 is rotatably mounted in spaced bearings 30 and 31 which are supported by the beams 1, these bearings serving to hold the cylinder in inclined position so that material directed into the rear end thereof will gravitate toward the forward end. The forward end of the cylinder has an annular worm gear 32 secured thereto and this receives motion from a worm 33 carried by a transverse shaft 34. A gear 35 is secured to the transverse shaft and receives motion through a gear 36 from a shaft 37 extending forwardly in suitable bearings. A gear 38 is provided at the forward end of this shaft and meshes with gear 14. Thus the operation of the motor shaft 11 will result in a slow rotation of cylinder 9 and in the rotation of the scarifier 17.

The forward or lower end of cylinder 29 is normally closed by opposed semi-circular gates 39 which are hingedly mounted at their upper ends and have blocks 40 swivelled on their outer faces. These blocks support an operating screw 41 having right and left threads engaging the respective blocks. The screw can be rotated by

any suitable means such as a handwheel 42 and when turned in one direction will swing the gates apart as indicated, for example, by broken lines in Figure 5. When turned in the opposite direction the screw will move the gates together so as to close the outlet end of the cylinder.

A scraping bar 43 is extended longitudinally within the upper portion of cylinder 29 and is fixedly mounted at its ends in any suitable supports provided therefor. This scraper contacts with the inner surface of the cylinder and is so inclined that as the cylinder rotates, any material adhering to the inner surface thereof will be scraped therefrom and gravitate to the bottom portion of the cylinder.

A shaft 44 extends longitudinally within the cylinder 29 through the length thereof but below the axis of rotation of the cylinder and on this shaft is a series of spirally arranged agitating fingers 45 which, in their lowermost positions, extend close to the surface of the cylinder, as shown in Figure 6. The shaft is journaled in any suitable bearings provided therefor and is connected at its forward end by a universal joint 46 to a shaft 47 operably connected by chain and sprocket mechanism 48 to the shaft 37. Thus as the cylinder 29 is rotated at one speed by the mechanism provided for that purpose, the shaft 44 will be driven at the same or at any other speed desired so that the fingers 45 will work through the bulk material in the cylinder and materially assist in the agitating and mixing thereof.

A bunker 49 is erected above the level of mixing cylinder 29 and an endless conveyor, indicated at 50, is adapted to direct material from apron 21 into the upper portion of the bunker. This conveyor is actuated by a chain and sprocket mechanism 51 receiving motion from sprocket 13. By means of gearing, indicated generally at 52, the conveyor can be caused to travel in the proper direction to elevate material while the cylinder 17, shaft 37, and other parts of the mechanism are being driven in the directions indicated by the arrows in Figure 1.

The bunker 49 has an outlet chute 53 which opens downwardly into the upper end of cylinders 29. A worm conveyor 54 is mounted for rotation in the bunker and serves to propel bulk material to the chute 53. This worm can be actuated by a gear 55 on its shaft 56, the said gear receiving motion through a gear 57 from a shaft 58. This shaft is driven through any suitable mechanism by a pump 59 which, in turn, receives motion through chain and sprocket mechanism, or the like indicated at 60, from roller 9. A tank 61 for holding heavy oil or other treatment material is mounted on the frame 1 and the contents thereof are adapted to be lifted by the pump and delivered through a pipe 62 into the upper portion of the chute 53.

The chute 53 has a lateral delivery spout 63 formed with a gate 64 for controlling the outlet 65 leading thereto. A deflecting slide 66 is mounted on the bottom of the chute and can be shifted upwardly and inwardly relative to the chute 53 so as to intercept material to be delivered at one side of the machine.

Arranged within the space between the side beams 1 of the frame are obliquely disposed scraping blades 67 which, as shown in Figure 3, are disposed in lapping relation, each being fastened at its forward end to one of the beams and being extended laterally and rearwardly. Thus material engaged by these blades will be spread laterally between the beams as the machine is moved forwardly.

In practice the machine is attached to a tractor or other propelling means. If preferred, a motor can be located on the machine so that it can advance under its own power. Engine 10 is used for actuating the scarifier, the elevator, and the mixer. Roller 9 is used for rolling the surface of the road and for operating the pump and the worm conveyor 54.

As the machine moves forward over the road to be resurfaced, the teeth of the scarifier will plow into and loosen the surface to a depth predetermined by the prior adjustment of arms 15. The material thus loosened will be gathered by apron 21 and will be delivered onto the elevator or conveyor 50 which, in turn, will direct it into the bunker 49. At this point the worm conveyor 54 will force the bulk material into chute 53, where it will be treated with the oil or other fluid being delivered through pipe 62 and both the broken material and the treatment fluid will be directed into the rear end of the inclined cylinder 29.

The rotation of the mixing cylinder and of the shaft 44 will result in thoroughly agitating the contents of the cylinder so that all solid matter contained in the cylinder will be thoroughly covered with the treatment material. When the material has been agitated for a desired length of time the gates 39 are opened and the material allowed to gravitate onto the road bed from which surface material had been removed. Here it will be spread by the spreaders 67 and subsequently compressed by roller 9 so that as the machine travels onward it will leave a well-finished road surface. Should it be desired to deliver material at the side of the road for any purpose it is necessary merely to open gate 64 and direct the deflecting slide 66 into the path of the stream of material being expelled from the bunker.

Obviously various adjustments requiring mechanical skill only can be employed for varying the tilt of the cylinder 29, for adjusting the frame angularly relative to axle 3, etc.

A screed 68 is preferably extended transversely of the frame between blades 67 and roller 9. By means thereof the depth of the relaid finishing material and the contour thereof can be controlled.

It will be understood, of course, that instead of using rollers 2 and 9 the machine could be supported by endless tracks.

What is claimed is:

A machine for finishing roads including a portable frame, a roller operable by the movement of the machine, a bunker having an outlet, means for expelling material therefrom, a tank, means for expelling material therefrom, a mixer for receiving materials from the expelling means and delivering them into the path of the roller, and separate means operated by the roller for actuating the respective material expelling means thereby to maintain a constant proportion of the two materials within the mixer irrespective of the speed of rotation of the roller and the quantity of materials delivered to the mixer.

LEE SWEARINGEN.