No. 690,374. Patented Dec. 31, 1901.

J. H. PEARCE.

MACHINE FOR MIXING PLASTICS.

(Application filed Oct. 10, 1901.)

(No Model.)

Fig. 1

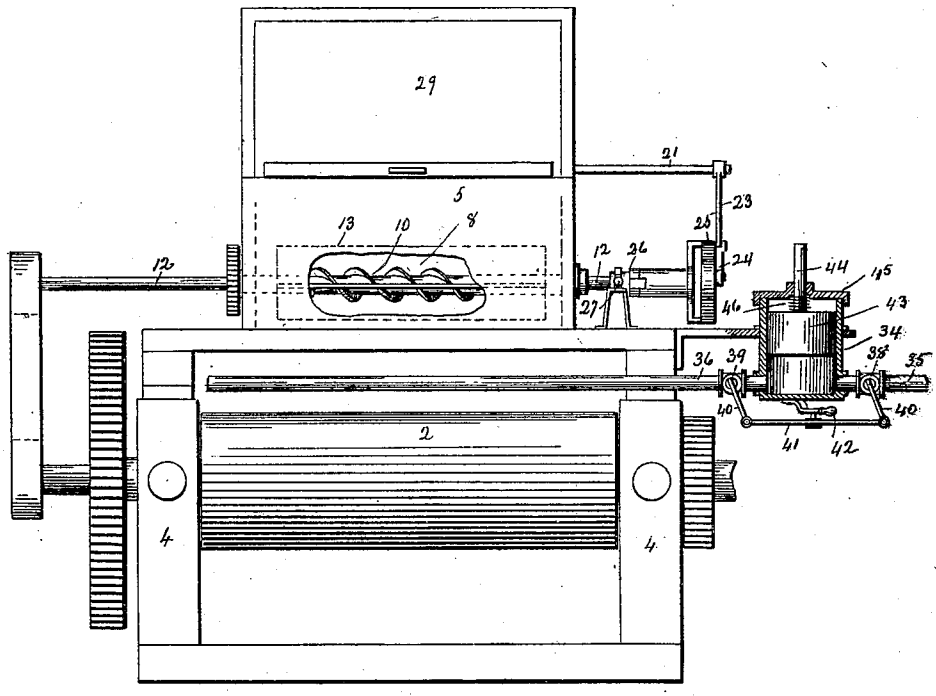


Fig. 2

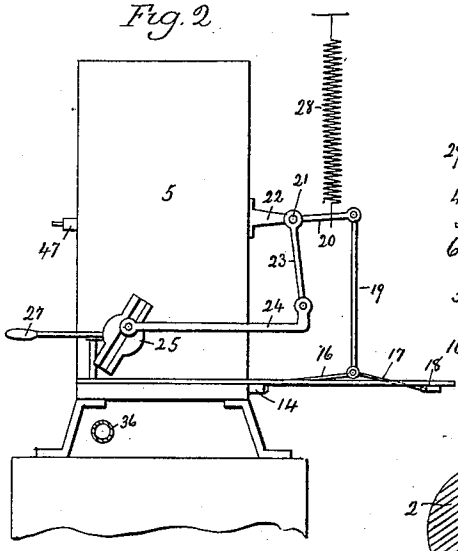
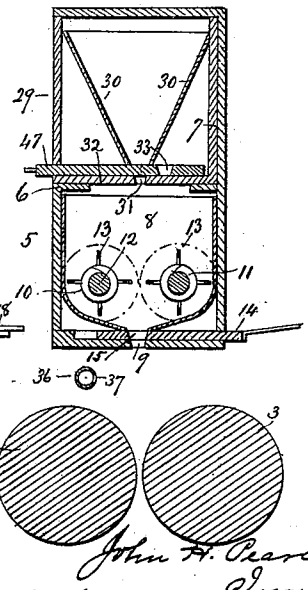


Fig. 3



Witnesses.
J. A. Shumway.
C. L. Reed.

John H. Pearce
Inventor.
By Attys Seymour & Pearce

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN H. PEARCE, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO HENRY STUART HOTCHKISS, OF NEW HAVEN, CONNECTICUT.

MACHINE FOR MIXING PLASTICS.

SPECIFICATION forming part of Letters Patent No. 690,374, dated December 31, 1901.

Application filed October 10, 1901. Serial No. 78,266. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. PEARCE, of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Machines for Mixing Plastics; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of a machine for working rubber comprising two rolls with my improved feeding device therefor; Fig. 2, a side view of the upper portion of the same with the reservoir removed; Fig. 3, a vertical central section through the housing of a feeding device and indicating the relation of the same to the mixing-rolls.

This invention relates to an improvement in machines for mixing plastics, and while particularly adapted for mixing rubber it is equally applicable for mixing other plastics in which powdered ingredients of various forms are mixed with a body by means of rollers.

In the usual manner of mixing rubber two or more rollers are employed, between which the body is fed and upon which the mixing substances are placed and worked into the body, with which they are united with tar and some other liquid binder. These mixing ingredients are in powdered form and consist of sulfur, litharge, whiting, resin, or other substance, according to the material being produced. In working rubber these powders are placed in quantities on the tops of rolls and tar or other binding substance poured upon them to unite them with the body passing through the rolls; but as the mixing substances are not mingled or confined they do not enter the body uniformly and drop from the rolls, so that uniform quantities are not worked into the body and a long time is required to combine the mixing ingredients with the body.

The object of this invention is to provide an automatic means for mixing the ingredients, whereby they will be thoroughly mingled and be fed in small quantities to the body passing through the rolls; and the invention consists in the construction as hereinafter described, and particularly recited in the claims.

For the purpose of illustrating the invention I have shown it in connection with two rolls 2 3, mounted in uprights 4 and suitably geared together to turn in opposite directions in the usual manner of rubber-working machines. Above the rolls I arrange a housing 5, divided by an inwardly-projecting flange 6, forming an upper chamber 7 and a lower chamber 8. In the center of the bottom of the lower chamber 8 is a longitudinal slot 9, and in this chamber are two Archimedean screws 10 11, the shafts of which are together to turn in opposite directions, and one of the shafts, as 12, coupled with the driving mechanism for the rolls 2 3 or otherwise. Around these screws are blades or strippers 13, adapted to sweep the sides of the chamber and direct the contents thereof to the slot 9.

In the bottom of the chamber 8 is a slide 14, having a longitudinal slot 15, adapted to register with the slot 9. The rear end of the slide is connected by links 16 17 with a fixed point 18, and the connecting ends of these links are coupled by a rod 19 with a lever 20, secured to a rock-shaft 21, mounted on a bracket 22, attached to the rear of the housing 5. At the outer end of this shaft is a lever 23, secured and turned by an arm 24, pivoted to an eccentric 25 on the shaft 12, with which it is adapted to be coupled by a clutch 26 of usual construction, said clutch having a forwardly-projecting handle 27. Preferably, and as herein shown, a spiral spring 28 will be connected between a fixed point and the lever 20, the tendency of which will be to lift the rod 19.

The front of the upper chamber 7 is open, adapting a box 29 to be placed therein, said box having tapering sides 30, which merge to an opening 31 in the bottom 32 of the box 29. Upon the bottom of the box is a slide 47, having an opening 33, adapted to register with the opening 31 in the bottom 32.

As a means for feeding tar or other liquid binder I employ a reservoir 34, which is mounted on the frame of the machine, and into one side of the reservoir a pipe 35 opens, said pipe leading from a tank. (Not shown.)

From the bottom of the reservoir, on the opposite side, a pipe 36 extends over the roll 2, and in this pipe are perforations 37, directed to the space between the rolls. In the pipes 35 36 are valves 38 39, having operating-levers 40, which are connected by a bar 41, which is adapted to be moved by handle 42, so that both valves may be operated at the same time, one to open and the other to close. In the reservoir is a weight or plunger 43, having a spindle 44, extending upward through the top 45 of the reservoir, and around this spindle, between the top of the reservoir and the plunger, is a spring 46, the tendency of which is to force the plunger downward.

It will be understood that the rolls are heated in the usual manner and that the pipes 35 36 and reservoir 34 will also be heated by steam-pipes arranged adjacent thereto or otherwise, so that the binder will flow freely.

The operation of the device is as follows: A mass of body material is placed between the rolls 2 3, which are constantly driven, and the mixing compounds are placed in the box 29, which is set in the housing 5, with the slide 47 forced back, so that the slot in the bottom of the box is closed. The slide 47 is then drawn forward, so that the opening therein registers with the slot 31 in the bottom 32, permitting the mixing compound to enter the chamber 8. The screws 10 11 therein being constantly driven will thoroughly mix these powders, one tending to carry the substance to one end of the chamber and the other in the reverse direction. After the powders have become thoroughly mixed the clutch 26 will be thrown to couple the eccentric 25 with the driving-shaft 12, and this eccentric, through the arm 24, lever 20, rock-shaft 21, lever 23, and rod 19, will alternately lift and depress the links 16 and 17 and move the slide 14 backward and forward, so as to cause the opening 15 therein to register with and close the slot 9 in the bottom of the chamber, permitting a portion of the mixing compound to drop between the rolls 2 3 every time the slide is drawn back. This movement of the slot is so timed that but a small quantity of the mixing compound will be fed to the rolls and will be equally distributed over the mass of body being worked. If the valve 39 be open and the valve 38 be closed, the tar or other liquid binder will flow into the reservoir 34, and the pressure should be sufficient to lift the plunger 43. When it is desired to feed the binder to the rolls, the levers of the valves 38 39 will be turned by the handle 42, so as to close the valve 39 and open the valve 38, permitting the binder to flow through the pipe 36, through which it will be forced by the downward movement of the plunger 43 and escape through the perforation 37, and thus be distributed throughout the length of the rolls. After the material in the reservoir has been fed the handle 42 will be turned to close the valve 38 and open the valve 39, when the reservoir will again be filled. In this way an exact amount of binding material may be used.

It is apparent that the mixing compound might be fed directly into the chamber 8; but preferably it will first be placed in the box 29. It is also apparent that a mixing compound may be used without the device for feeding the binder and that binder placed upon the rolls in the usual manner. It is further evident that the valves 38 39 might be operated singly or be coupled with the eccentric 25, so as to automatically operate; but preferably they will be opened and closed simultaneously by an attendant. If desired, also the Archimedean screws may be omitted, as the blades or strippers are sufficient to mingle the powder ingredients within the chamber.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for mixing plastics, the combination with the rolls thereof, of a chamber mounted above said rolls, means within said chamber for mingling powdered substances and means for automatically opening and closing the bottom of the chamber substantially as described.

2. In a machine for mixing plastics, the combination with the rolls thereof, of a chamber arranged above said rolls, and having an opening in its under side, mixing-blades mounted in said chamber, a slide adapted to open and close the opening in the bottom of said chamber, and means for moving said slide back and forth to open and close the said chamber substantially as described.

3. In a machine for mixing plastics, the combination with the rolls thereof, of a chamber arranged above said rolls and having an opening in its lower side, agitators comprising feed screws and blades within said chamber, a slide in the bottom of said chamber and adapted to open and close therein, means for moving said slide back and forth substantially as described.

4. In a machine for mixing plastics, the combination with the rolls thereof, of a mixing-chamber above said rolls, agitators within said chamber and means for revolving the same, a slide in the bottom of said chamber and adapted to open and close the opening therein, connections between said slide and the means for revolving said agitators whereby the slide will be moved back and forth substantially as described.

5. In a machine for mixing plastics, the combination with the rolls thereof, of a housing arranged above said rolls and comprising two chambers with a passage between them, agitators within the lower chamber and means for driving them in opposite directions, a box adapted to be set into the upper chamber, said box having a sliding bottom adapted to register with the passage into the lower chamber, a slide in said lower chamber having an opening adapted to register with the open-

ing in the bottom of said chamber, and means for moving said slide back and forth, substantially as described.

6. In a machine for mixing plastics, the combination with the rolls thereof, of a chamber mounted above said rolls, means within said chamber for mingling powdered substances, means for automatically opening and closing the bottom of the chamber, a reservoir with inlet and outlet pipes extending therefrom, said outlet-pipe extending over said rolls and perforated valves in said inlet and outlet pipes, and means for opening and closing the same, substantially as described.

7. In a machine for mixing plastics, the combination with the rolls thereof, of a reservoir having inlet and outlet pipes, said outlet-pipe perforated and extending over said rolls, a plunger within said reservoir, valves in said inlet and outlet pipes and means for opening and closing the same substantially as described.

8. In a machine for mixing plastics, the combination with the rolls thereof, of a housing arranged above said rolls comprising an upper and lower chamber with a communicating slot, agitators in said lower chamber and means for revolving the same, a slide in the bottom of said lower chamber adapted to open and close the opening in the bottom thereof, means for automatically moving said slide back and forth, a box adapted to be placed into the upper chamber and having a sliding bottom with an opening adapted to register with the passage into the lower chamber, a reservoir with inlet and outlet pipes therefrom, said outlet-pipe perforated and extending over said rolls, valves in said inlet and outlet pipes, and means for opening and closing the same substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN H. PEARCE.

Witnesses:
FREDERIC C. EARLE,
CLARA L. WEED.