June 22, 1954 S. A. EARNSHAW 2,681,725

MATERIAL THROWER FOR COATING MACHINES

Filed June 20, 1949 2 Sheets-Sheet 1

Fig. 1

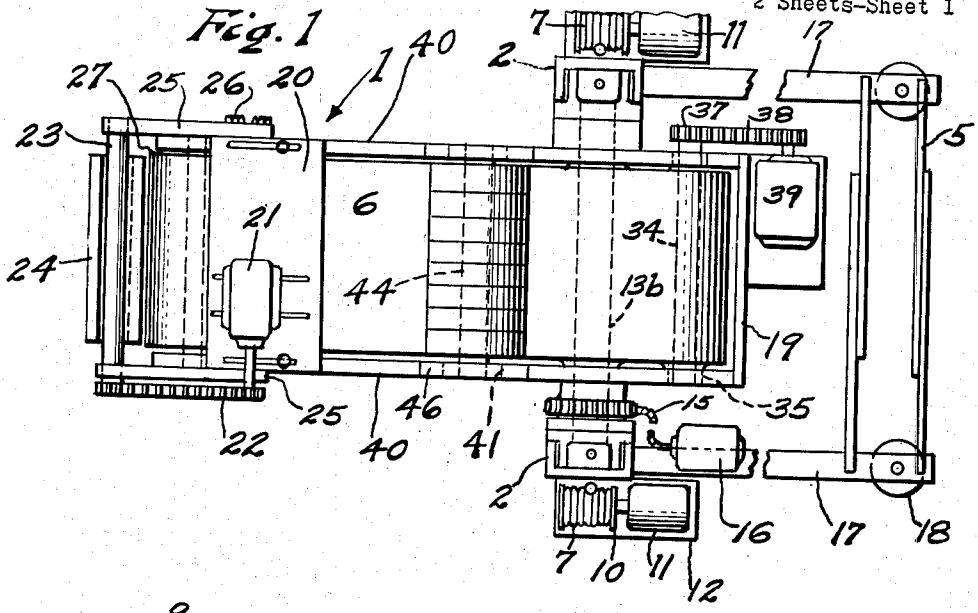
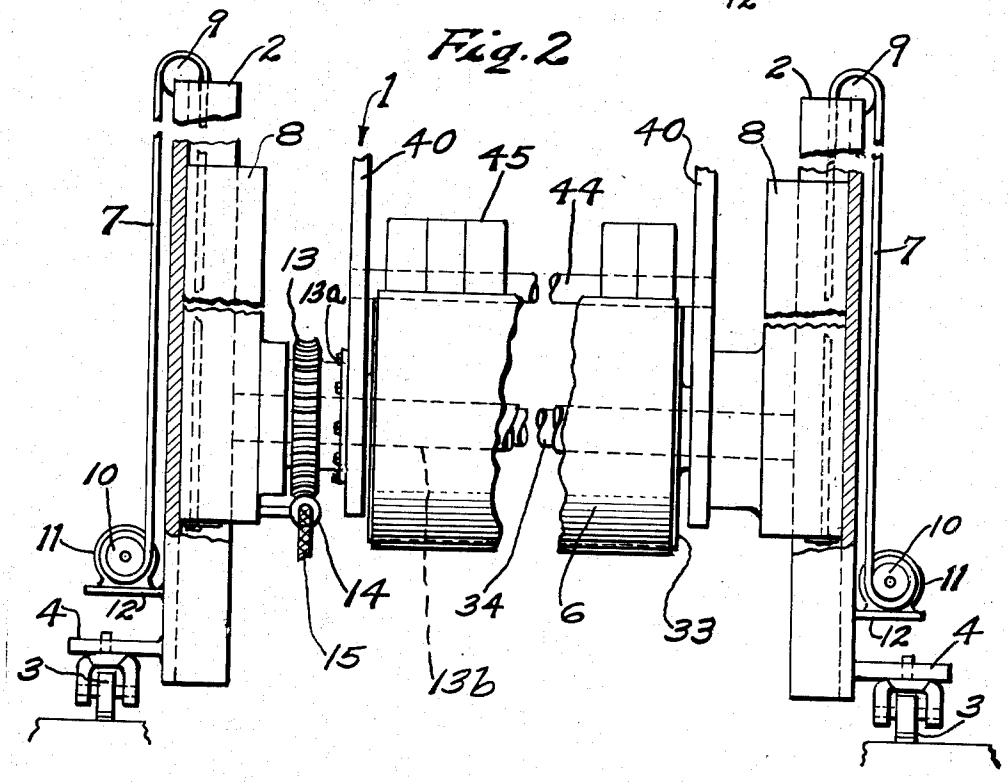


Fig. 2



INVENTOR
SPENCER A. EARNSHAW

By John A. McDowell
his atty.

June 22, 1954 S. A. EARNSHAW 2,681,725

MATERIAL THROWER FOR COATING MACHINES

Filed June 20, 1949 2 Sheets-Sheet 2

Fig. 4

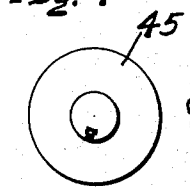


Fig. 3

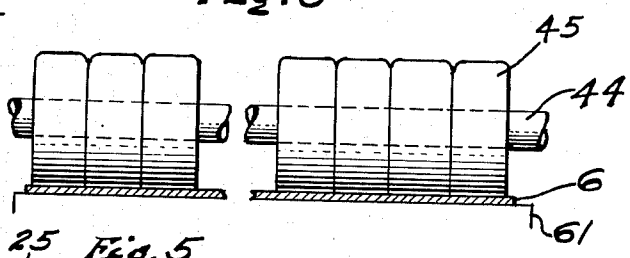


Fig. 5

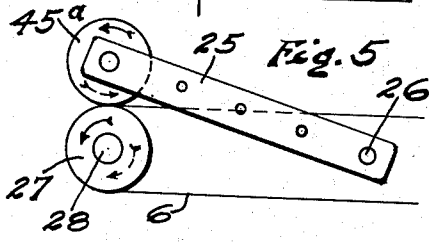


Fig. 7

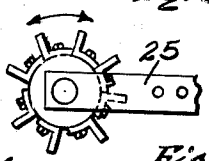


Fig. 6

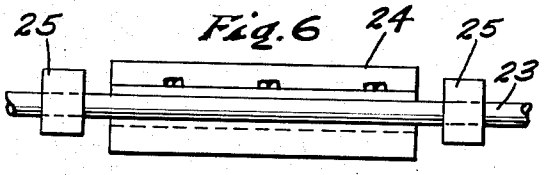


Fig. 8

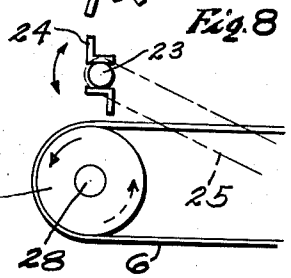


Fig. 9

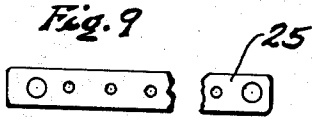
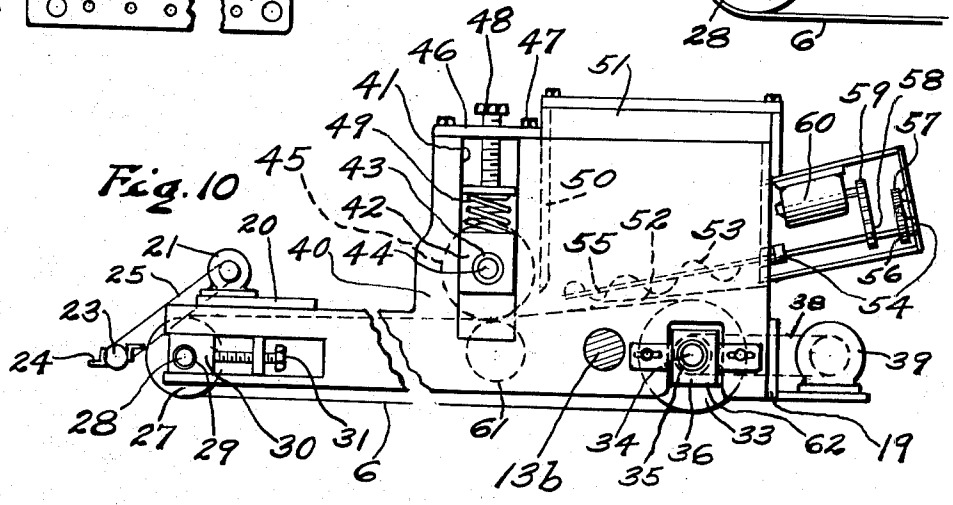


Fig. 10



INVENTOR
SPENCER A. EARNSHAW
By John A. McDowell
his atty.

Patented June 22, 1954

2,681,725

UNITED STATES PATENT OFFICE

2,681,725

MATERIAL THROWER FOR COATING MACHINES

Spencer A. Earnshaw, Los Angeles, Calif.

Application June 20, 1949, Serial No. 100,147

4 Claims. (Cl. 198—128)

1

This invention relates to a coating machine wherein a belt drive is used and especially adapted for applying a coating material such as cement like material to walls and other surfaces, for example the coating of pipes and coating of ditches and tunnels and other shaped articles and for filling forms; and an object of this invention is to improve the method of applying materials in the construction of structures, such as walls, retaining walls and lining or coating and many other surfaces.

Another object of the invention is to able to direct a stream of material in many directions in relation to the horizontal and to lift the entire body of the machine or to lower it while pointing at a desired angle.

Another object is to have free movement in supporting a material removing device so as to remove material from a surface while the work is in progress.

A further object of the invention is to move the belt surface so that it may come in contact with the work which it has applied, for the purpose of rubbing against said surfaces.

Another object of the invention is to regulate the amount of pressure applied on the material which is on the belt.

Another object is to throw material particles at high speeds.

An advantage of the invention is to change the direction of the travel of the belt so that it may travel forward or reverse.

A further object of the invention is that the machine can be used for throwing clay particles in the manufacture of clay products such as pipe, brick and tile and other articles.

The invention may have a variety of applications and certain of the features of construction may be embodied in a variety of structures.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is a plan view of the invention.

Fig. 2 is an enlarged fragmental rear end view of Fig. 1.

Fig. 3 is a fragmental detail view of the pressure rollers.

Fig. 4 is a side view of a roller with a valve for inflation purposes.

Fig. 5 is a side view showing a pressure roller over end of belt pulley and means of mounting said pressure roller.

2

Fig. 6 is a front view showing the impeller mounted on a shaft supported by extension arms.

Fig. 7 shows means of mounting a multiple number of impeller blades.

Fig. 8 shows a side view of the impeller in position above the belt to remove material from the belt.

Fig. 9 is a detail side elevational view of one of the extension arms.

Fig. 10 is a fragmental side elevation view looking at the left side of the machine that shows the belt with adjustment take up with the impeller mounted in front of the belt and also shows the pressure rollers and spring adjustment, hopper and motor driving means.

It is understood that the coating machine may be made in different shapes and sizes and various parts of the invention may be constructed without departing from the spirit of the invention; but the form shown is at present deemed most desirable for easy and cheap construction and ready interchange of parts.

This invention comprises a frame unit 1 so constructed and arranged to be raised and lowered in the uprights 2 that may be of channel construction being supported by rollers 3 and brackets 4, adjustable tie members 5 that are used to brace the uprights and to adjust the width of the machine when different widths of the frame unit 1 are used and to raise one edge of the belt 6 higher than the other edge of the belt.

A cable 7 fastened to slide members 8 and placed over pulleys 9 wind around drums 10 which are driven by motors 11 are fastened to uprights 2 by brackets 12.

Revolvably mounted to slide plate 8 is frame unit 1 having a worm gear wheel 13 which is mounted on shaft 13b and being fixed at 13a to one side of the frame unit 1 which is driven by worm 14 that is driven by the flexible shaft 15 by motor 16.

Frame unit 1 is held together by plates 19 and 20 and the plate 20 is adjustable and holds motor 21 which drives chain 22 that drives impeller shaft 23 upon which is mounted a multiple number of blades 24. I use a pair of extension arms 25 which are adjustably mounted and may be of any desired length and are supported by bolts 26 and the impeller blades 24 have several functions one of which is to remove material from a surface such as a wall which has been coated.

At the front of the unit frame 1 is a pulley 27 mounted on shaft 28 which has bearings 29 on each end and bearing boxes 30 that are adjustable by bolts 31.

Around pulley 27 belt 6 extends and backward over drum 33 which is mounted on shaft 34 that is mounted in bearings 35 and bearing box 36 on each end, and shaft 34 is provided with a sprocket 37 at one end. Chain 38 extends over sprocket 37 which is driven by a motor 39 that is reversible in drive and which is adjustable to various speeds which will be of great value in the use of the machine such as, when material is being removed from a surface, the belt may act as a receiver for such material and be driven backwards to make room for more material; then by reversing the belt, the said material can be thrown by the impeller to fill up holes or hollows that may appear in the coating.

Side plates 40 are provided with recesses 41 and mounted therein are guide bearing boxes 42 provided with bearings 43 that are mounted to shaft 44 and at each end.

A resilient roller 45 composed of tire like units is mounted on shaft 44 and forms contact with the surface of the belt 6 and revolves when the belt is driven.

At the top of recesses 41 are plates 46 which are bolted to plates 40 by bolts 47 and therein is provided a screw 48 which provides adjustment through the plates and springs 49, whose purpose is to hold bearing boxes 42 in position, so that the resilient roller 45 will have spring action and provide tension against belt 6.

A guard plate 50 forms the front of the hopper 51 and plate 52 forms the bottom.

I provide a multiple number of feed screws or worms which move the material along plate 52 and force material onto belt 6 and force the material between belt 6 and roller 45 as the belt is driven clockwise, as viewed in Figure 10. By using a multiple number of these feed screws 53 a very wide stream of material can be fed to belt 6, which is an improvement in the feeding of these types of machines where a wide stream of material is desired. Feed screws 53 have extension shafts 55 that may be constructed of tube like material upon which are mounted thrust bearings or holders 54.

Gear wheels 56 are also mounted on extension shafts 55, and gears 56 mesh with gears 57 so that the screws 53 will revolve in the same direction at the same time. A sprocket wheel 58 is mounted on one of the shafts 55 and is driven by chain 59 by motor 60 which is reversible in drive.

In order to hold the surface of belt 6 against the roller 45 I place a pressure roller 61 below the upper surface of belt 6 that is used to put pressure against the belt 6 that may be mounted by extension arms similar to arms 25.

I provide an adjustable means in the form of an adjustable housing 62 wherein is mounted bearing 36 for adjustment of the drum 33 and belt 6 for alignment of the belt as shown in Fig. 10 of the drawings.

In Fig. 5 is shown a pressure roller 45*a* mounted over pulley 27 at the front end of belt 6 used for the purpose of giving the material the earliest possible pressure when the belt is driven counterclockwise and to give the material a final pressure when the belt is driven clockwise to determine the tangent that the material will leave the belt.

In Fig. 7 is shown a multiple number of detachable impeller blades mounted on a drum and they may be made of any suitable material such as rubber or any other kind desirable to accomplish the best results so that any one of the blades may be replaced when damaged.

The operation, uses and advantages of the invention just described are as follows:

By way of example, if a wall is to be plastered, suitable plastering material is placed within the hopper 51. The frame 1 is adjusted as to position, preferably so that said frame extends horizontally as shown in Figures 2 and 10, and adjacent the floor. The motor 39 drives the belt 6, while the motors 11 raise or lower the frame, the frame carrying slides 8, which are guided as to movement on the uprights 2. When the motors 39 and 60 are energized, the belt 6 moves, and the plastering material is fed by the feed screws 53 between the top surface of the upper reach of the belt 6 and the roller 45. The plastering material will be directed from the belt onto the wall to be plastered. During such an operation, the motors 11 are energized to lift the frame 1 progressively from a lower level to higher levels and the entire frame may be revolved as to position so that the material ejected from the belt surface may strike the wall being plastered at an angle. This is accomplished through the gear and worms shown at 13 and 14, which worm is driven by the flexible shaft 15 connected to motor shaft 16. The advantage of being able to raise or lower the entire frame relative to a structure to be coated, as well as a tipping of the frame to different angularities relative to horizontal during such a raising or lowering will be immediately apparent to those skilled in the art. The blades 24 mounted upon the impeller shaft 23 are adjustable as to position relative to the belt 6, and specifically the roller 27, over which the belt 6 is passed, whereby said shaft, by adjusting the position of the arms 25, may be above the belt, as shown in Figure 8, forwardly thereof, as shown in Figure 10, or may assume other positions. As shown in Figure 10, the shaft 23 is driven by a motor 21, and the blades 24 act upon the material carried on the belt 6 to increase or decrease the driving speed with which said material will strike the surface to be coated, and to direct the path of movement of the material.

The roller 45 is made up of tire-like units, each of which has an individual yielding action, and which units engage the surface of the belt 6 as illustrated in Figure 3, so that material delivered from the hopper 51 by the feed worms 53 will receive the momentum of the belt and the pressure roller.

I claim:

1. In a machine of the class described comprising an upright frame unit mounted on wheels to be moved in various directions; a pair of slide members slidably mounted on said upright frame unit; power means to raise and lower said slide members; a horizontal shaft mounted in said slide members; a frame unit mounted on said horizontal shaft and having fixed thereto a worm gear wheel that meshes with a worm attached to a slide member, motor and flexible means to drive said worm and worm wheel that revolve said frame unit around said horizontal shaft; a pulley at the front end adjustably mounted in said last mentioned frame unit; a pulley adjustably mounted near the rear in the last mentioned frame unit; an endless belt extending around said pulleys, motor means to drive said belt; a roller composed of tire like units mounted on a shaft; each unit having a desired diameter and each unit having individual yielding action; a hopper having a multiple number of worms, and

power means to drive said worms to force material from the hopper at a velocity onto the belt so that the material will receive the momentum of the belt and the pressure roller and be thrown against a surface to be coated.

2. A machine of the class described provided with an upright frame mounted on wheels, a pair of slide members mounted in said upright frame, a shaft mounted in each slide member, a frame unit mounted on said shaft, a motor, a worm and worm gearwheel to revolve said frame around said shaft, a hopper on said frame, a multiple number of worms in said hopper, means to drive said worms, said hopper bottom formed with an aperture, a roller beneath said hopper adjustably mounted in said frame unit, a second roller remote from said first mentioned roller, an endless belt extending around said rollers, means to drive said belt, a roller mounted forwardly of said hopper, which revolves when said belt is driven, said roller being adjustable to hold the belt to the desired curvature to maintain pressure against the belt surface and material particles on the belt, an arm adjustably mounted on the side of said frame at the front end, a second arm adjustably mounted on the opposite side of said frame and adjustable to various alignments with said first mentioned arm, a shaft mounted in self-aligning bearings at each end of said shaft, said bearings being mounted in said arms, a multiple number of removable resilient blades mounted on said shaft, a motor and means to drive said shaft to impel material particles that come in contact with said resilient blades and means to cause said blades to come in contact with said material particles.

3. The device as set forth in claim 2, characterized in that the said roller mounted forwardly of said hopper comprises a multiple number of tire-like units of rubber-like material.

4. In a machine of the class disclosed, an upright frame unit mounted on wheels to be moved in various directions; a pair of slide members slidably mounted on said upright frame unit; power means to raise and lower said slide members; a horizontal shaft mounted in said slide members; a frame unit mounted on said horizontal shaft and having fixed thereto a worm gear wheel that meshes with a worm attached to a slide member, motor and flexible means to drive said worm and worm wheel that revolve said frame unit around said horizontal shaft; a pulley at the front end adjustably mounted in said last mentioned frame unit; a pulley adjustably mounted near the rear in the last mentioned frame unit; an endless belt extending around said pulleys, motor means to drive said belt; a roller composed of tire-like units mounted on said shaft; each unit having a desired diameter and each unit having individual yielding action; a hopper having a multiple number of worms, power means to drive said worms to force material from the hopper at a velocity onto the belt; and a transverse roller adjustably positioned adjacent the front end of the frame unit and in contact with the belt to regulate the discharge tangent of the material leaving the belt.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
236,489	Garrett	Jan. 11, 1881
1,040,253	Ray	Oct. 1, 1912
1,065,365	Higgins	June 24, 1913
1,523,275	Ney	Jan. 13, 1925
1,895,608	Conley	Jan. 31, 1933
2,069,589	Meijling et al.	Feb. 2, 1937
2,168,329	Earnshaw	Aug. 8, 1939
2,178,360	Kohout	Oct. 31, 1939
2,333,426	Jolly	Nov. 2, 1943
2,391,597	Schwendner	Dec. 25, 1945