Aug. 25, 1942. F. A. BAILEY 2,293,881

SPRAY COATING MACHINE

Filed July 1, 1941 2 Sheets-Sheet 1

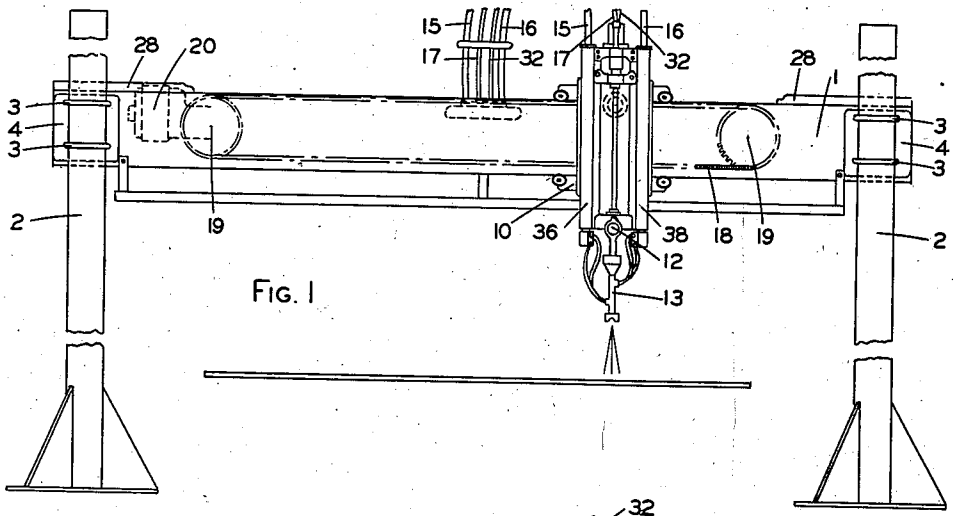


FIG. 1

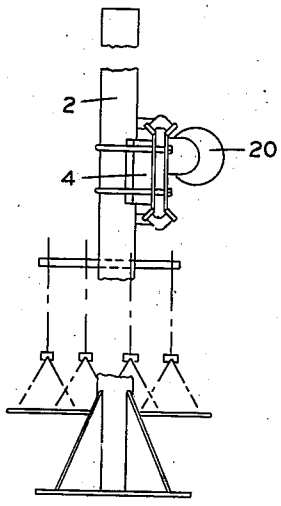


FIG. 2

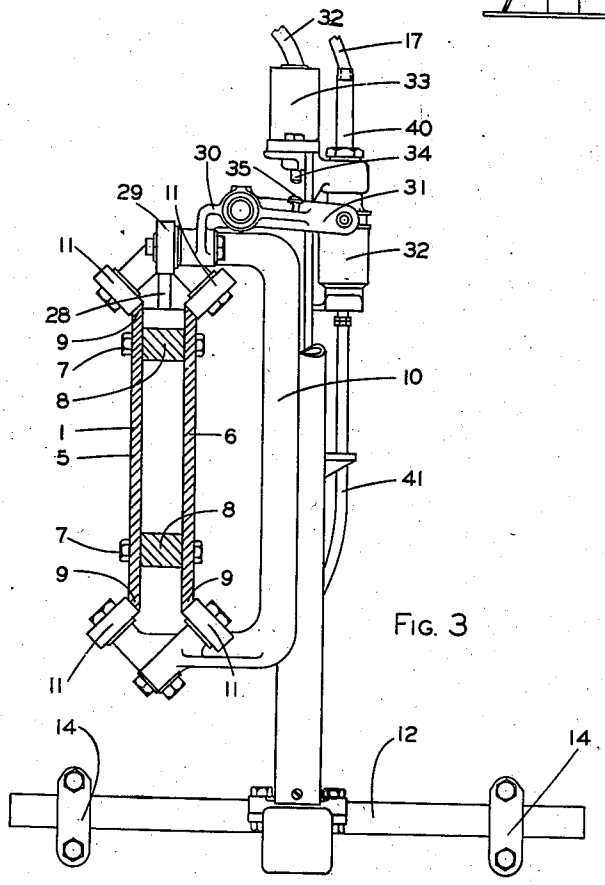


FIG. 3

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SPRAY COATING MACHINE

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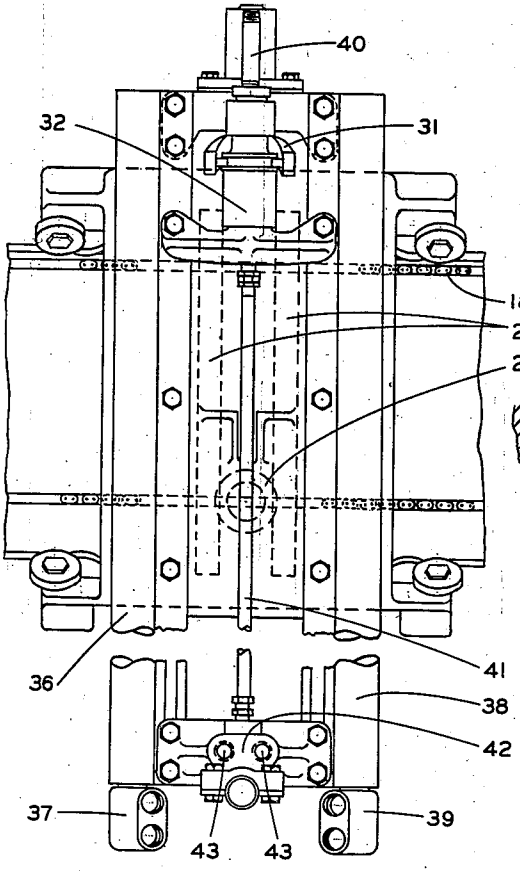


FIG. 4

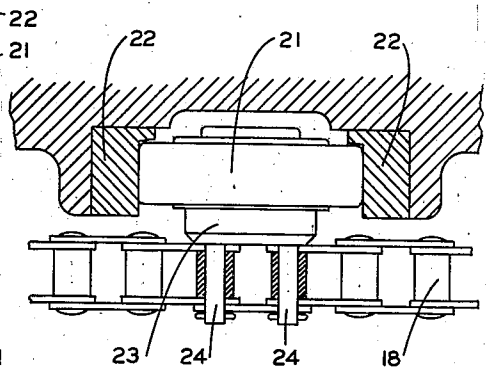


FIG. 6

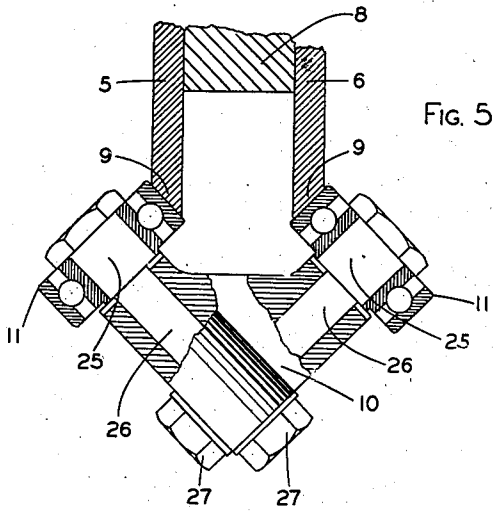


FIG. 5

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SPRAY COATING MACHINE

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Application July 1, 1941, Serial No. 400,679

5 Claims. (Cl. 91—45)

This invention relates to spray coating machines of the type in which one or more spray guns are mounted on a carriage which travels back and forth upon a track. The spray discharge is ordinarily directed downwardly against the surface of materials carried past the spraying position upon a conveyor. Materials and objects with large flat surfaces; such as, wall board, fabrics, glass, hides, refrigerator panels, and rugs are coated particularly effectively by such coating apparatus.

The principal purpose of my invention is to provide a compact machine of this type which will operate efficiently over a long period with a minimum of wear and breakage.

An object of my invention is to provide a track for the spray gun carriage that is rigid, accurately aligned and sturdily constructed. Another object of my invention is to provide means for taking up wear between the bearing surfaces of the track and the spray gun carriage. A further object of my invention is to provide an efficient driving means for the carriage and a wear resisting connection between the driving chain and the spray gun carriage.

The features of the invention which render the foregoing objects possible of accomplishment reside in the provision of a track formed of two parallel plates bolted together in spaced face-to-face relation, provision of means for moving the rollers of the carriage in closer contact with the bearing surfaces of the track and in the provision of means for providing a semi-free connection between the chain and carriage. Other objects and advantages of my invention will be apparent during the course of the following specification.

In the accompanying drawings:

Fig. 1 is a front elevation of a spray coating machine illustrating one embodiment of my invention;

Fig. 2 is an end elevation as viewed from the right hand end of Fig. 1 with a diagrammatic showing of four spray guns;

Fig. 3 is an end elevation of the carriage as viewed from the other end of Fig. 1 but with the carriage at one end of the track and showing a cross section of the track;

Fig. 4 is an enlarged front elevational view of the carriage showing further details not brought out in Fig. 1;

Fig. 5 is an enlarged view of one set of the lower rollers of the carriage with parts broken away and showing a partial view of the lower edges of the track which the rollers contact; and

Fig. 6 illustrates details of the driving connection between the chain and carriage.

With reference to the drawings the machine shown consists of a track 1 supported at the ends by tubular columns 2 to which it is fastened by U-bolts 3. A spacer block member 4 fits between the track and each column as an adapter. The track 1 is composed of two plates 5 and 6 held together by two series of bolts 7 which pass thru the spacing and plate supporting rectangular bars 8. These extend the full length of the track. The edges 9 of the plates are machined to form surfaces of 45° facing outwardly. The carriage 10 has four pairs of rollers 11 which ride upon the edge surfaces 9 of the plates 5 and 6.

From a cross arm 12 one or more spray guns indicated at 13 are fastened to the carriage by clamps 14. Coating liquid for the spray guns is brought to the carriage by a flexible hose or tubing partially shown at 15. Likewise, atomizing air is supplied by flexible hose 16.

The liquid valve of each spray gun is operatively connected to an air piston. It is necessary to have a flexible hose for bringing operating air to the carriage for this purpose. Such a hose is indicated at 17.

For driving the carriage an endless chain 18 is mounted over sprockets 19, one of which is driven by a motor 20. As shown in Fig. 6, the chain 18 has a roller 21 rotatably mounted on one side of the chain. This roller contacts the carriage thru two vertically positioned gibs 22 with parallel faces against which the roller alternately bears. In order to avoid any trouble from the roller cocking in its runway, plenty of clearance is provided. While there are slightly flaring restraining shoulders at the rear of the gibs the roller is free to move outwardly from between the gibs. However, the tension of the chain prevents the roller from coming out too far. As shown in Fig. 6 the roller 21 is rotatably mounted on a stud 23 which has two pins 24 extending from its opposite side. These pins act as integral parts of the chain to join together adjacent links.

In case there is any wear on either the upper or lower bearing surfaces 9 of the plates 5 and 6 forming the track and the contact of the rollers with the carriage thereby becomes too loose, means for bringing the lower rollers and upper rollers closely together is illustrated in Fig. 5. A portion of the carriage on which two of the lower rollers 11 are mounted is illustrated in this figure. The bearings 11 are mounted on journal sections 25 of bolts 26 which are held rigidly in position by nuts 27. The journal sections 25 are eccentric to

the main body of the bolts 26 and thereby the rollers may be moved nearer or farther away from the bearing surfaces 9 of the plates 5 and 6 by turning and resetting the bolts. In the positions of the bolts shown in Fig. 5 the bearings have been brought approximately into their uppermost positions. The rollers of the carriage which ride on the upper edges of the track are mounted on concentrically journaled sections of bolts as any take up necessary may be secured thru adjustment of the eccentric bolts supporting the lower rollers. In Fig. 4 further details of the carriage are shown. It may be noted that the roller bearing 21 is dotted in as are also the gib members 22.

In order to discontinue the spray beyond the edges of the surfaces being coated, cam members 28 are mounted at both ends of the track. As the carriage approaches an end, the roller 29 on rocker arm 30 rides up on the cam 28. The rocker arm 30 has a yoke 31 at its other end which actuates a valve 32 (details of which are not shown). This valve shuts off the air supply from the flexible tube 17 and releases air beyond the valve that normally holds the spray gun in open position by its pressure upon a piston within the spray gun connected to the liquid valve. A spring closes the liquid valve when the counteracting air pressure is reduced. The spray discharge is thus shut off when this air is released. When the rocker arm 30 follows roller 29 down from the cam 28 as the carriage moves away from the end of the track, the yoke 31 on the other side of the rocker arm moves the valve to a position to permit air from the flexible tube 17 to reach the spray gun and to put the spray gun into operation thru its effect upon the piston in the spray gun controlling the liquid valve.

In order that the spraying operation may be interrupted in the event that for some reason the feeding of the material to be coated is momentarily delayed, a manually operable air valve (not shown) may be opened to allow air to pass thru air hose 32 to the cylinder 33 in which there is a piston (not shown) which forces rod 34 against the rocker arm at the button 35 to thereby actuate valve 32 to release the air beyond the valve which operates the spray gun. The liquid supply hose 15 enters a metal tube 36 mounted on the carriage and is led into manifold 37 to which other flexible hose are connected for leading the liquid to the individual spray guns. Likewise on the carriage is mounted a metal tube 38 into which the atomizing air hose 16 is passed and connected to distributing manifold 39. From the manifold 39 flexible tubes carry atomizing air to the individual spray guns. The air for actuating the spray guns passes from air hose 17 into the nipple 40 thru the valve 32 and into connecting tube 41 which leads to a manifold 42 with outlets indicated at 43. The spray guns for which this particular equipment is designed are of the type shown and described in Patent No. 2,052,953 issued to Robert W. Tracy September 1, 1936.

While I have described my invention in a preferred form, I desire it to be understood that modifications may be made and that no limits upon the invention are intended other than those imposed by the scope of the appended claims.

What I claim is:

1. In a spray coating machine, a spray gun carriage, upper and lower pairs of rollers on the carriage, the axes of the rollers of each pair being normal to each other, a horizontally disposed track for the carriage composed of two rectangular plates rigidly fixed in spaced and parallel relation with their upper and lower edges beveled outwardly to serve as riding surfaces respectively for the upper and lower pairs of rollers of the carriage, and means to reciprocate the carriage on the track including a chain mounted over two sprockets one at each end of the track, a driving roller attached to the chain, a vertical runway on the carriage having two parallel opposed surfaces against which the driving roller alternately bears as it travels with the chain.

2. In a spray coating machine, a spray gun carriage, upper and lower pairs of rollers on the carriage, the axes of the rollers of each pair being normal to each other, a horizontally disposed track for the carriage composed of two rectangular plates rigidly fixed in spaced and parallel relation with their upper and lower edges beveled outwardly to serve as riding surfaces respectively for the upper and lower pairs of rollers of the carriage, and means to reciprocate the carriage on the track including a chain mounted over two sprockets one at each end of the track, a driving roller attached to the chain, a vertical runway on the carriage having two parallel opposed surfaces against which the driving roller alternately bears as it travels with the chain, the parallel surfaces being spaced to provide plenty of clearance for the driving roller and provided with slightly flaring shoulders along their inner edges on the side away from the chain to restrain inward movement of the driving roller.

3. In a spray coating machine of the type having a track positioned across a conveyor and a spray gun carriage mounted upon said track with driving means for moving the carriage back and forth over the work to be coated, a track formed of two opposed rectangular plates fastened rigidly together in spaced relation extending lengthwise in a horizontal position with the flat surfaces of the plates in parallel vertical planes the upper and lower edges of each plate forming bearing surfaces in planes at angles of substantially 45° to the plane of the outer surface of the plate whereby the upper bearing surface of one plate is in a plane substantially normal to the plane of the upper bearing surface of the other plate, and the plane of the lower bearing surface of one plate is substantially normal to the plane of the lower bearing surface of the other plate, and a carriage having a pair of rollers which ride along the upper bearing surfaces of the plates and another pair of rollers which ride against the lower bearing surfaces of the plates, adjustable bolts having eccentric journal sections upon which the second pair of rollers are mounted whereby the rollers may be drawn in closer contact with the lower bearing surfaces of the plates by turning the bolts until the axes of the eccentric journal sections are brought nearer the lower bearing surfaces, and releasable locking means for the bolts to hold them in any desired position.

4. In a spray coating machine of the type having a track positioned across a conveyor and a spray gun carriage mounted upon said track with driving means for moving the carriage back and forth over the work to be coated, a track, upward-facing bearing surfaces along the upper portion of the track, downward-facing bearing surfaces along the lower portion of the track, a carriage, a pair of rollers on the carriage which ride along upon the upward-facing bearing surfaces of the track, a second pair of rollers on the carriage which ride against the downward-facing

bearing surfaces of the track, adjustable bolts having eccentric journal sections upon which the second pair of rollers are mounted whereby these rollers may be drawn in closer contact with the downward-facing bearing surfaces of the track by turning the bolts until the axes of the eccentric journal sections are brought nearer to the bearing surfaces, and releasable locking means for the bolts to hold them in any selected position.

5. In a spray coating machine of the type having a track positioned crosswise of the path of a conveyor and a spray gun carriage mounted upon said track with driving means for moving the carriage back and forth along the track, a track extending across the path of the conveyor formed of two opposed rectangular plates fastened rigidly together in spaced relation with the flat surfaces of the plates in parallel planes which are normal to the path of the conveyor, the outer lengthwise edge (that farther away from the conveyor) and the inner lengthwise edge (that nearer the conveyor) of each plate forming bearing surfaces in planes at angles of substantially 45° to the plane of that flat surface of the plate facing away from the other plate, whereby the outer bearing surface of one plate is in a plane substantially normal to the plane of the outer bearing surface of the other plate, and the inner bearing surface of one plate is in a plane substantially normal to the inner bearing surface of the other plate, a reciprocating spray gun carriage disposed on one side of the track having a pair of rollers which ride upon the outer bearing surfaces of the plates and a pair of rollers which ride upon the inner bearing surfaces of the plates, means to reciprocate the carriage on the track including a chain mounted over two sprockets, one at each end of the track, roller driving means attached to the chain, and a guide for the roller driving means on the carriage having two parallel surfaces against which the roller driving means alternately bears as it travels with the chain and drives the carriage back and forth across the track.

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