May 9, 1939. E. C. ZABLOCKI 2,157,724

GLUE SPREADING MACHINE

Filed Oct. 7, 1937 2 Sheets-Sheet 1

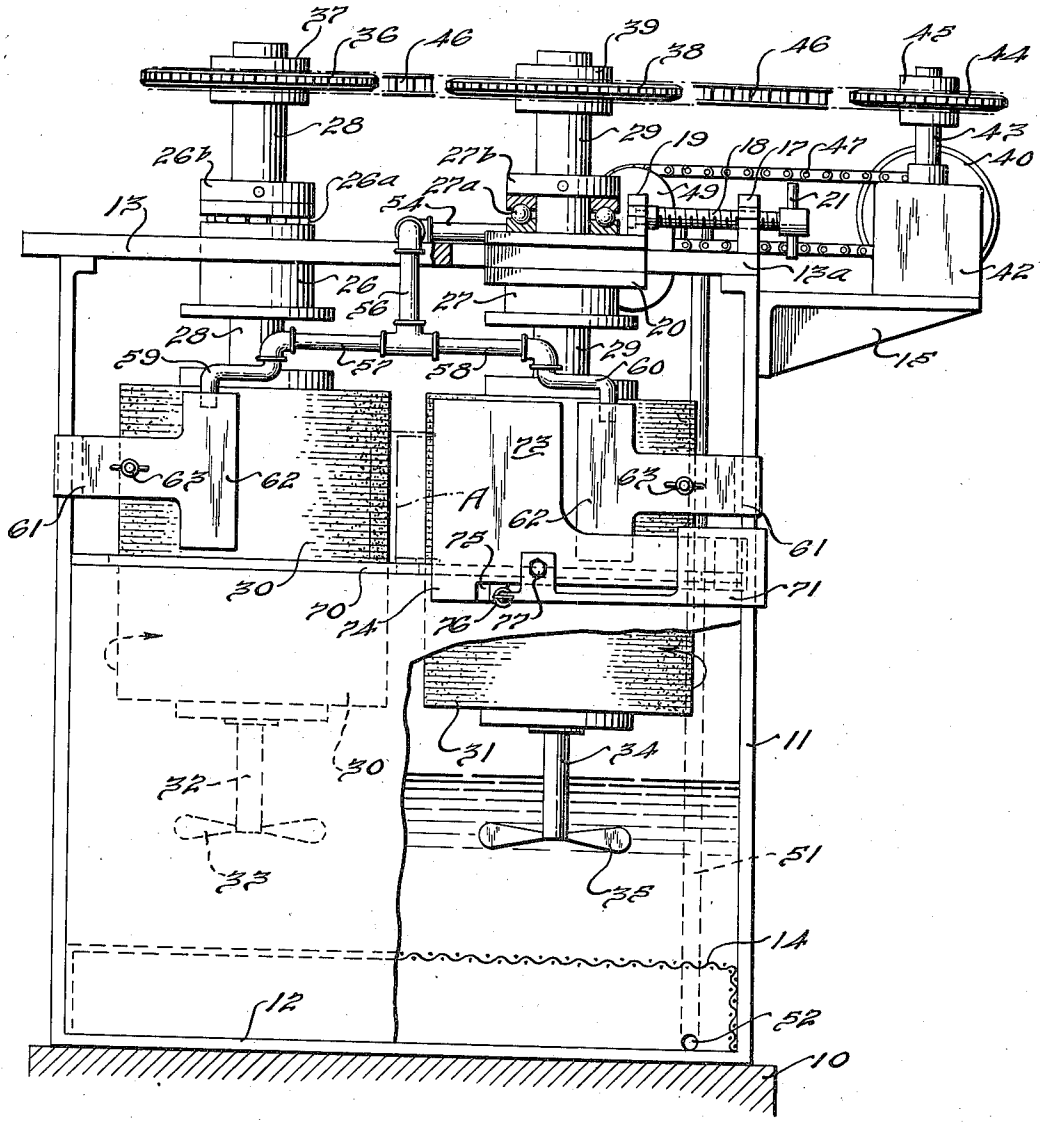

FIG. 1.

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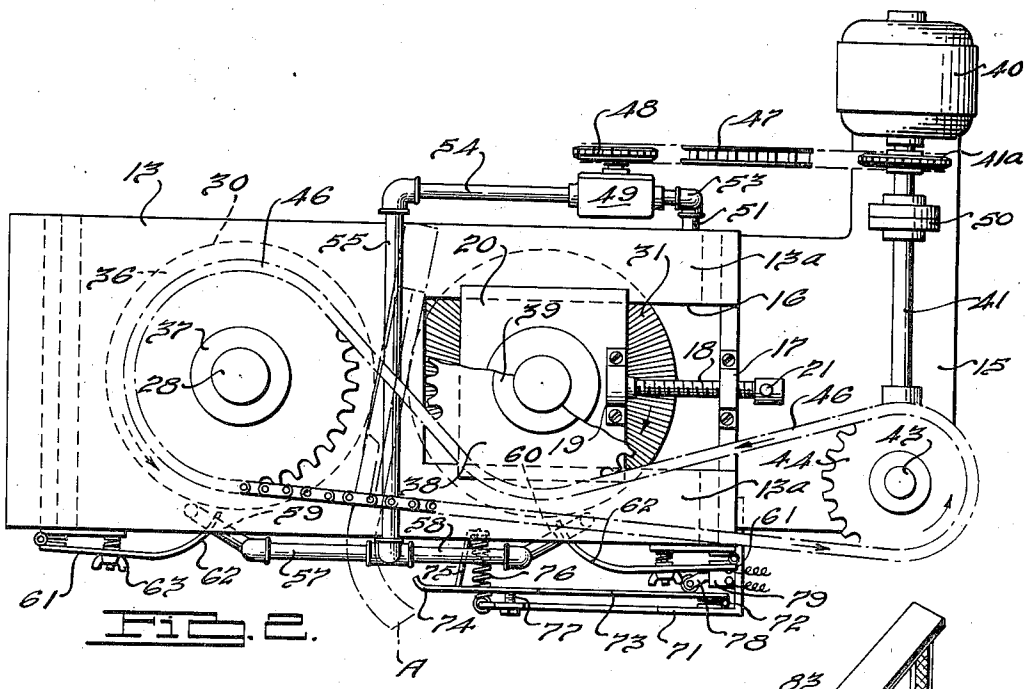

Fig. 2.

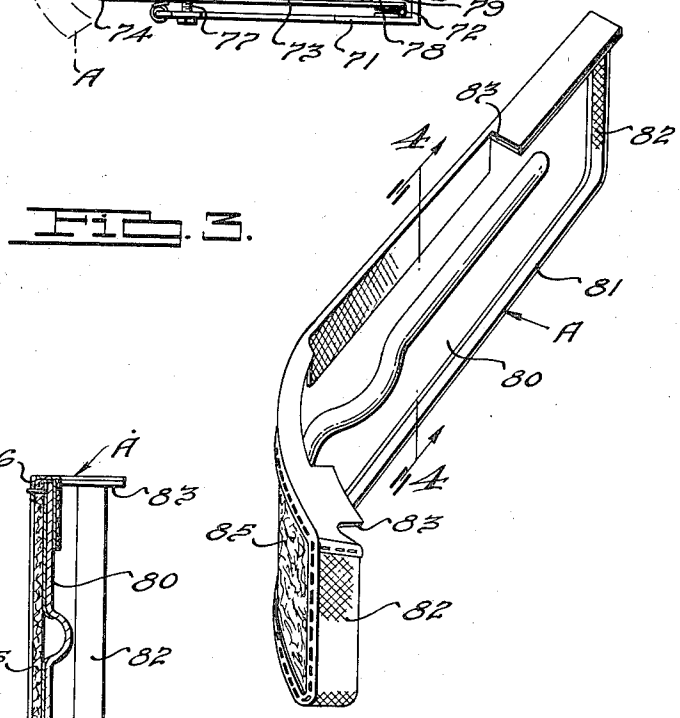

Fig. 3.

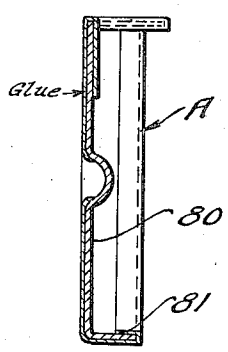

Fig. 5.

Fig. 4.

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GLUE SPREADING MACHINE

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Application October 7, 1937, Serial No. 167,781

14 Claims. (Cl. 91—39)

This invention relates to coating machines adapted particularly although not exclusively for applying a coating of adhesive or other material to flat or curved articles provided, in some instances, with a marginal flange or flanges.

An object of the invention is to provide a machine of the foregoing character which will quickly and economically apply a coating to curved metal articles such, for example, as shields employed for filling the space at and/or below the ends and corners of seats for motor vehicle bodies, wherein it is desirable to cover the panel with trim fabric corresponding to or harmonizing with the remainder of the interior trim of the vehicle body, the coating of adhesive serving to secure the fabric to the metal shield or panel.

Another object of this invention is to provide a coating machine having rotary brushes and a simple means of feeding to the brushes the material to be applied by the machine.

Another object of the invention is to provide a coating machine having a pair of upright or vertically disposed rotatable brushes or applicators, in which the brushes have their peripheries spaced apart to permit the passage therebetween, and the contact with, work pieces being fed in upright positions.

Another object of the invention is to provide a machine capable of applying a full surface coating to one face and the flange or flanges of the work piece and a negligible amount or minimum of coating material to the opposite face thereof.

Another object of the invention is to provide a machine capable of effecting economies in manufacture through the use of a minimum amount of adhesive beyond that actually needed for coating the work pieces.

The above and other objects of the invention will appear in the following description and appended claims, when considered in connection with the accompanying drawings forming a part of this specification, wherein like reference characters designate corresponding parts in the several views.

In said drawings:

Fig. 1 is a front elevational view, partly in section and partly broken away, showing one embodiment of a machine made in accordance with the present invention.

Fig. 2 is a top plan view of the machine of Fig. 1, parts thereof being broken away for the purpose of clearness.

Fig. 3 is a perspective view of one of the work pieces coated by the present machine.

Fig. 4 is a vertical section taken substantially along the line 4—4 of Fig. 3, looking in the direction of the arrows; and

Fig. 5 is a view similar to Fig. 4 showing the work piece with its coating of adhesive and prior to the application of the trim fabric thereto.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring particularly to Figs. 1 and 2 of the drawings, the machine according to the present embodiment is shown mounted upon a base 10, and comprises a rectangular metal casing open at front and back in its upper portion and having in its lower portion a tank or reservoir 11 provided with four surrounding walls, a bottom 12 and a top portion 13, 13a. A horizontal partition 70, having a pair of spaced openings therein provides, in effect, a cover for the tank 11. The tank or reservoir is provided with a screen or filter 14 which, as seen, extends horizontally across the tank above the bottom thereof. As shown, the right end or side wall of the casing is provided adjacent the top thereof with an offset bracket or shelf 15 for a purpose to be described.

The top or cover 13 at the left side thereof is imperforate except for an opening arranged preferably centrally thereof to receive a journal or bearing 26 for supporting the drive shaft of one of a pair of rotary brushes. The remaining part or half of the cover 13a has a rectangular opening 16 therein, and a threaded bracket or bearing 17 for a threaded shaft 18. The threaded shaft is connected at its inner end with a bearing or bracket 19 carried by a pair of vertically spaced slidable blocks or plates 20 arranged above and below and slidable relatively to the housing top or cover portions 13a, see Fig. 1. The outer end of the threaded shaft 18 is provided with a finger piece 21. As will be described hereinafter, the adjustable or sliding blocks 20 carry the hub or bearing 27 for the other rotatable brush of the machine, the purpose being to permit adjustability of the right hand bearing 27 and its brush relative to the left hand bearing 26 and its supported brush.

As seen, the bearing 26 is formed in two super-

imposed parts separated by a ball bearing race 26a. The bearing 27 is similarly formed in sections which are separated by a ball bearing race 27a. These bearings are constructed to support the suspended brushes within the tank or casing.

The parts 26 and 27 provide bearings for tubular members or sleeves 28 and 29 of the brushes 30 and 31, respectively. Extending through the sleeve 28 and fixed thereto is a shaft 32 carrying at its lower end a bladed agitator 33. The sleeve 29 is similarly fixed to an internal shaft 34 which has at its lower end an agitator 35. The upper end of the sleeve 28 carries a sprocket 36 provided with a hub 37 keyed to the sleeve and shaft. The sleeve 29 carries a similar sprocket 38 having a hub 39 which is also keyed to the sleeve 29 and its shaft 34. The upper portion 26b and the similar portion 27b of the bearings are pinned or secured to their respective sleeves or tubular members 28 and 29, respectively. It will be understood that the bearing portions 26 and 27 are fixed against rotation to the tank cover portions 13 and 13a, respectively, and that each tubular member 28, 29 is rotatably associated with the bearing portions 26 and 27 respectively. The ball races 26a and 27a ensure frictionless rotation of the sleeves and shafts and their respective brushes.

The platform or bracket 15, previously referred to, provides a support for an electric motor 40 having a horizontally disposed split or divided shaft 41. The outer end of the shaft 41 extends into a gear box 42 which encloses driving gearing of conventional construction (not shown). Extending vertically from within the gear box 42 is a driven shaft 43 which carries adjacent its upper end a sprocket 44 having a hub 45 fixed to the shaft. As best seen in Fig. 1 the sprockets 36, 38 and 44 are located in a common horizontal plane and are interconnected by means of a sprocket chain 46. The sprocket chain 46 passes around and engages the teeth of sprockets 36 and 44. The curved stretch of the sprocket chain 46 engages the peripheral teeth of the sprocket 38. By this arrangement, movement of the chain in the direction of the arrows in Fig. 2 causes the sprocket 36 and brush 30 to rotate in a counter-clockwise direction or to the right of Figs. 1 and 2, while the sprocket 38 and brush 31 are being rotated in a clockwise direction or to the left in Figs. 1 and 2. Thus it will be seen that the sprockets 36 and 44 and the left hand brush 30 rotate in one direction, whereas the brush 31 and its sprocket 38 rotate at the same speed but in the opposite direction. Moreover, the particular organization of parts permits the relative adjustment of the sprockets 36 and 38 and brushes 30 and 31 without the necessity of releasing the chain.

The motor shaft 41 carries a sprocket 41a which is connected, through the medium of a sprocket chain 47, with a sprocket 48 mounted on a driven shaft forming a part of the mechanism of a pump shown as a whole at 49. The pump may be of any standard construction, such, for example, as a centrifugal or gear type pump. To facilitate assembly and disassembly of the parts the motor shaft 41, as shown, is formed in two sections detachably joined together by a coupling 50 of conventional construction.

The machine of the present invention is designed to convey adhesive from the tank or reservoir 11 and discharge it directly onto the peripheries of the rotatable brushes 30 and 31, adjacent the tops of said brushes. As shown, there is provided a pipe or conduit 51 having its intake or lower end 52 located adjacent the bottom of the tank beneath the filter or strainer 14. This pipe is connected at 53 (Fig. 2) with the intake side of the pump 49. Another pipe 54 is connected with the discharge side of the pump 49 and has a forward horizontal extension 55 to the outer end of which is attached a T-pipe connection comprising a vertical leg 56 and a pair of oppositely extending horizontal legs 57 and 58. The outer end of the leg 57 of the pipe is provided with an L-connection 59 having a discharge or outlet end substantially vertically disposed and adjacent the periphery of the brush 30. The other leg 58 of the pipe has a similar extension 60 with a substantially vertically disposed discharge or outlet end similarly positioned with respect to the periphery of the brush 31. The discharge end 59 of the pipe and the brush 30 have associated with them an adjustable shield and scraper 61, the inner curved end 62 of which is movable toward and away from the periphery of the brush and serves to control the thickness of the adhesive layer or coating on the brush as well as to shield the lower end of the pipe 59, see particularly Fig. 1. The shield and scraper 61 is formed in two parts, one of which is mounted upon the face of the housing or tank 11, the other part being hingedly connected to it and adjustable relative thereto into various fixed positions by means of a spring pressed wing nut and bolt structure, shown as a whole at 63. A similar guard or shield and scraper is provided for the brush 31 and the discharge end 60 of the adhesive pipe line and functions in the same manner as does the previously described scraper. When the electric motor 40 is operated the pump is driven so as to feed adhesive from the bottom of the tank to the peripheries of the two brushes while these brushes are being rotated in opposite directions toward the center of the machine through the medium of the sprockets and chain connection above described. Unused adhesive drips from the brushes back into the tank and is strained by the screen or filter 14.

As clearly seen in Figs. 1 and 2, the brushes are vertically arranged with their peripheries spaced apart so as to permit the passage therebetween, edgewise above the partition 70, of a work piece such as the work piece A. By reason of the adjustability of the brush 31 and its associated parts relative to the brush 30, work pieces of varying thicknesses may be passed through the machine to be coated on opposite faces by the two opposed brushes. The lower ends of the brush supporting and driving shafts, as described above, carry the agitators 33, 35 which serve to keep the adhesive in the tank constantly moving. The adhesive or other liquid is used over and over again and by reason of the strainer or filter 14 and the location of the pipe intake 52 beneath it, clean or strained adhesive is always supplied to the brushes.

Since the front of the machine adjacent the upper or exposed portions of the brushes 30 and 31 is open to permit passage of the work between the brushes, it is desirable to have some sort of safety device to prevent the operator from moving his hand into contact with the brushes. For this purpose I have employed a conventional type of safety device which is manually controlled to operate an electric switch upon contact with a part thereof to shut off the power and stop the machine. As best seen in Fig. 2, the device comprises a supporting bracket 71 secured to the wall of the casing 11 and to the inner face of which

is attached, by means of a hinge 72, a swinging plate 73 provided with a lead end 74. The member 73 has an offset projection 75 which supports one end of a coil spring 76. The other end of the coil spring is secured to the end of the bracket 71 and tends to normally maintain the member 73 in its inoperative or forward position in contact with a stop screw 77. When, however, the hand of the operator, or the outer end of the work piece A contacts the lead portion 74, the member 73 is moved inwardly against the action of the spring and functions to move the switch operating member 78 to throw the switch 79 and shut off the current to the electric motor 40.

Merely by way of example I have shown in detail in Figs. 3, 4 and 5 a typical work piece to be coated by the present embodiment of the machine of my invention. The piece illustrated as a whole at A is adapted to be placed adjacent or beneath the opposite ends of the front seat of an automobile body of the sedan type, for example, for the purpose of concealing the mechanism located below the seat for adjusting it and so that the interior trim will harmonize throughout the body. In accordance with the present disclosure the panel piece A comprises a curved metal plate or stamping 80 having a flange 81 along one longitudinal edge which extends around the ends thereof at 82, and a partial flange or a pair of spaced flanges 83 at the other longitudinal edge of the piece. It is desirable to apply to the metal piece 80 a piece or strip of trim fabric or cover shown at 85 having its marginal edges preferably provided with a leather or fabricoid binding 86. The purpose of the machine is to coat the outer face of the metal panel so that the trim fabric will stick to it when applied and also to coat with adhesive both faces of the continuous flange 81, 82 and the outer face of the flanges 83 so that the binding, when folded around or pressed upon the flanges, will stick thereto.

Previously, trim pieces such as the panel A have been coated by the use of spray guns or by hand with brushes. This procedure was slow, wasteful and therefore costly because of the use of more of the adhesive material than was necessary. By reason of the fact that the brushes 30 and 31 are spaced apart, the operator is enabled to feed the work piece between the brushes with the face of the piece that is to be completely coated held against the left hand or the right hand brush, as the case may be, and out of contact with the opposite brush except for the engagement of the ends of the bristles thereof with the flanged portions of the work piece. This effects a considerable saving of adhesive since the inner face of the panel, which need not be coated, is only coated in spots with a minimum of adhesive.

As stated above the work piece herein shown is illustrative of only one of a number of uses for the present machine.

I claim:

1. In a coating machine, a pair of upright rotary brushes between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being out of contact with the liquid in the reservoir, an agitator in said reservoir, and rotary means including a pump for projecting liquid from the reservoir onto a brush or brushes.

2. In a coating machine, a pair of vertically disposed rotary brushes between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being out of contact with the liquid in the reservoir, agitating means within the reservoir and immersed in said liquid, and means for feeding liquid from the reservoir directly to the periphery of each of the brushes.

3. In a coating machine, a pair of vertically disposed rotary brushes between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being spaced above and out of contact with the liquid in the reservoir, a pipe line extending from the reservoir to the brushes, and a pump in the line for feeding liquid through said pipe line from the reservoir to the peripheries of both of said brushes.

4. In a coating machine, a pair of rotary brushes mounted on vertical shafts and between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being out of contact with the liquid in the reservoir, an agitator carried by the lower end of each shaft and immersed in the liquid in said reservoir, means for rotating the brushes in opposite directions, a pipe line having its intake end located in the reservoir and a pair of outlet ends adjacent the perepheries of the brushes, and a motor operated pump for drawing liquid from the reservoir through the pipe line and discharging it onto the peripheries of said brushes.

5. In a coating machine, a pair of rotary brushes mounted on vertical shafts and between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being out of contact with the liquid in the reservoir, an agitator carried by the lower end of each shaft and immersed in the liquid in said reservoir, means for rotating the brushes in opposite directions, a pipe line having its intake end located in the reservoir and a pair of outlet ends adjacent the peripheries of the brushes, a motor operated pump for drawing liquid from the reservoir through the pipe line and discharging it onto the peripheries of said brushes, and a combined shield and scraper for each of the brushes located adjacent the outlet ends of said pipe line.

6. In a coating machine, a pair of rotary brushes mounted on vertical shafts between which the work to be coated is fed, a reservoir for containing coating liquid, an agitator carried by the lower end of each shaft and immersed in the liquid in said reservoir, means for rotating the brushes in opposite directions, a pipe line having its intake end located adjacent the bottom of the reservoir and a pair of outlet ends adjacent the peripheries of the brushes, a motor operated pump for drawing liquid from the reservoir through the pipe line and discharging it onto the peripheries of said brushes, and an adjustable scraper for each of the brushes located adjacent the outlet ends of said pipe line for controlling the quantity of coating liquid applied to the work.

7. In a coating machine, a pair of rotary brushes mounted on vertical shafts between which the work to be coated is fed, a reservoir for containing coating liquid, said brushes being out of contact with the liquid in the reservoir, an agitator carried by the lower end of each shaft and immersed in the liquid in said reservoir, means for rotating the brushes in opposite directions, a pipe line having its intake end located in the reservoir and a pair of discharge ends adjacent the peripheries of the brushes, a motor operated pump for drawing liquid from the reservoir through the pipe line and discharging it onto the peripheries of said brushes, a scraper for each of the brushes located adja-

cent the discharge ends of said pipe line, and a safety device located adjacent the path of movement of the work for automatically stopping the machine when engaged by the work or the hand of the operator.

8. In a coating machine, a pair of vertically disposed brushes having their peripheries spaced apart and between which the work to be coated is fed in upright position, a tank for containing coating liquid, a strainer located in the tank and spaced from the bottom thereof, a pipe line having an intake end in the tank below the strainer and having a pair of discharge ends located adjacent the peripheries of said brushes, a pump connected with said pipe line for withdrawing coating liquid from the tank and discharging it upon the peripheries of the brushes, and common power operated means for rotating the brushes and operating the pump.

9. In a coating machine, a pair of vertically disposed brushes having their peripheries spaced apart and between which the work to be coated is fed in upright position, a tank for containing coating liquid, a strainer in the tank spaced from the bottom thereof, a pipe line having an intake located within the tank below the strainer and having a pair of discharge ends located adjacent the peripheries of said brushes, a pump connected with said pipe line for withdrawing coating liquid from the tank and discharging it upon the peripheries of the brushes, common power operated means for rotating the brushes and operating the pump, and a shield having a scraper edge associated with the peripheries of each of the brushes and located adjacent the discharge ends of the pipe line for controlling the quantity of liquid applied by the brushes to the work.

10. In a coating machine, a pair of vertically disposed brushes having their peripheries spaced apart and between which the work to be coated is fed, a tank for containing coating liquid, a strainer in the tank spaced from the bottom thereof, a pipe line having its intake end located within the tank below the strainer and having a pair of discharge ends located adjacent the periphery of said brushes, a pump connected with said pipe line for withdrawing coating liquid from the tank and discharging it upon the peripheries of the brushes, common power operated means for rotating the brushes and operating the pump, a shield having a scraper portion associated with the peripheries of each of the brushes and located adjacent the discharge ends of the pipe line, and an electrically controlled safety device positioned adjacent the path of movement of the work for stopping the machine upon engagement therewith of the work or a portion of the operator's body.

11. In a coating machine, a pair of vertically disposed rotatable shafts, a brush secured to each of said shafts for rotation therewith and between which the work to be coated is fed, a reservoir for containing liquid located below said brushes, a pipe line having an intake end located within the reservoir and discharge ends located adjacent the upper portions of the brushes adjacent the peripheries thereof, a sprocket carried by the upper end of each of the vertical shafts, an electric motor having a shaft provided with a sprocket, a sprocket chain connecting the sprockets on the vertical shafts with the sprocket on the motor shaft whereby operation of the motor causes rotation of the vertical shafts and brushes in opposite directions, and a pump connected with the pipe line and operated by said motor for transferring liquid from the reservoir onto the peripheries of the brushes.

12. In a coating machine, a pair of vertically disposed rotatable shafts, a brush secured to each of said shafts for rotation therewith and between which the work to be coated is fed, a reservoir for containing coating liquid located below said brushes, a pipe line having an intake end located within the reservoir and discharge ends located adjacent the upper portions of the brushes adjacent the peripheries thereof, an agitator carried by the lower end of each shaft and immersed in the liquid of the reservoir for agitating the liquid during rotation of the shafts, a sprocket carried by the upper end of each of the vertical shafts, an electric motor having a shaft provided with a sprocket, a sprocket chain connecting the sprockets on the vertical shafts with the sprocket on the motor shaft whereby operation of the motor causes rotation of the vertical shafts and brushes in opposite directions, and a pump associated with the pipe line and operated by the motor for transferring liquid from the reservoir onto the peripheries of the brushes.

13. In a coating machine, a pair of vertically disposed brushes having their peripheries spaced apart and between which work to be coated is fed, a tank for containing coating liquid, means for feeding liquid from the reservoir to the peripheries of both brushes, means for adjusting the brushes toward and away from one another to vary the space between their peripheries, and an adjustable scraper associated with each of said brushes for controlling the quantity of coating liquid applied to the work.

14. In a coating machine, a pair of vertically disposed brushes having their peripheries spaced apart and between which work to be coated is fed, a tank for containing coating liquid, means for feeding liquid from the reservoir to each of said brushes including a discharge nozzle positioned adjacent the periphery of each brush, means for adjusting one of said brushes relative to the other brush to vary the space between the peripheries thereof, and an adjustable scraper for each brush located adjacent each of the discharge nozzles for controlling the quantity of coating liquid applied to the work.

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