

March 4, 1930.

V. M. DIRKES ET AL

1,749,326

STRIPING TOOL

Filed Sept. 6, 1928

3 Sheets-Sheet 1

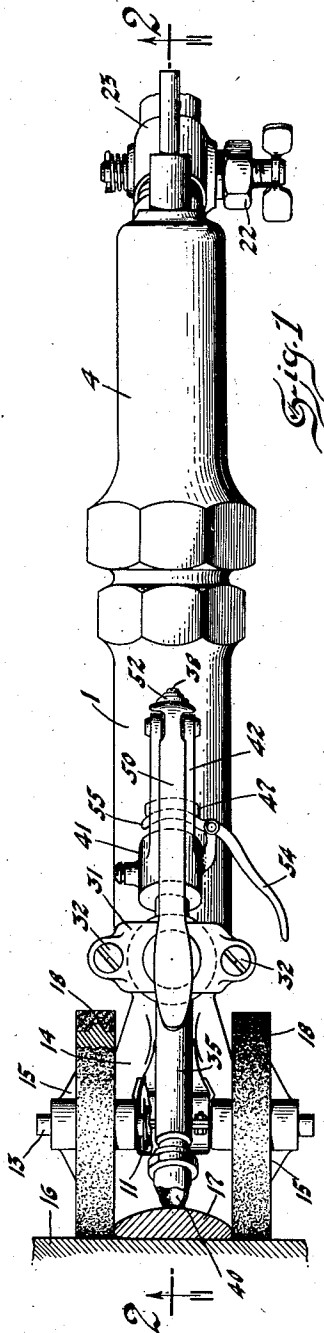


Fig. 1

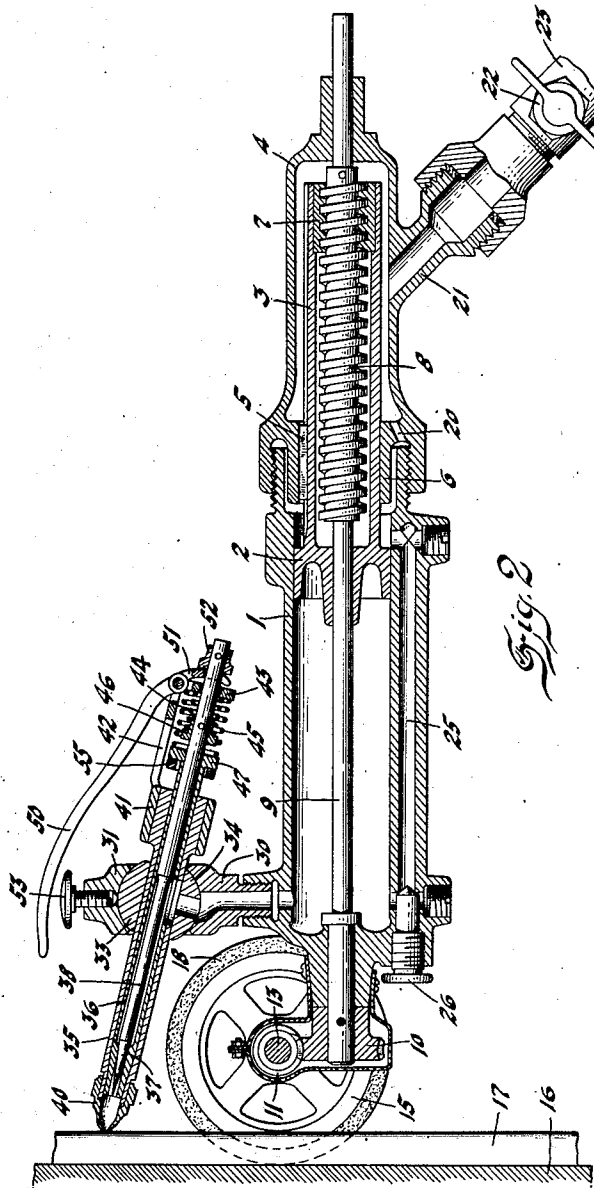


Fig. 2

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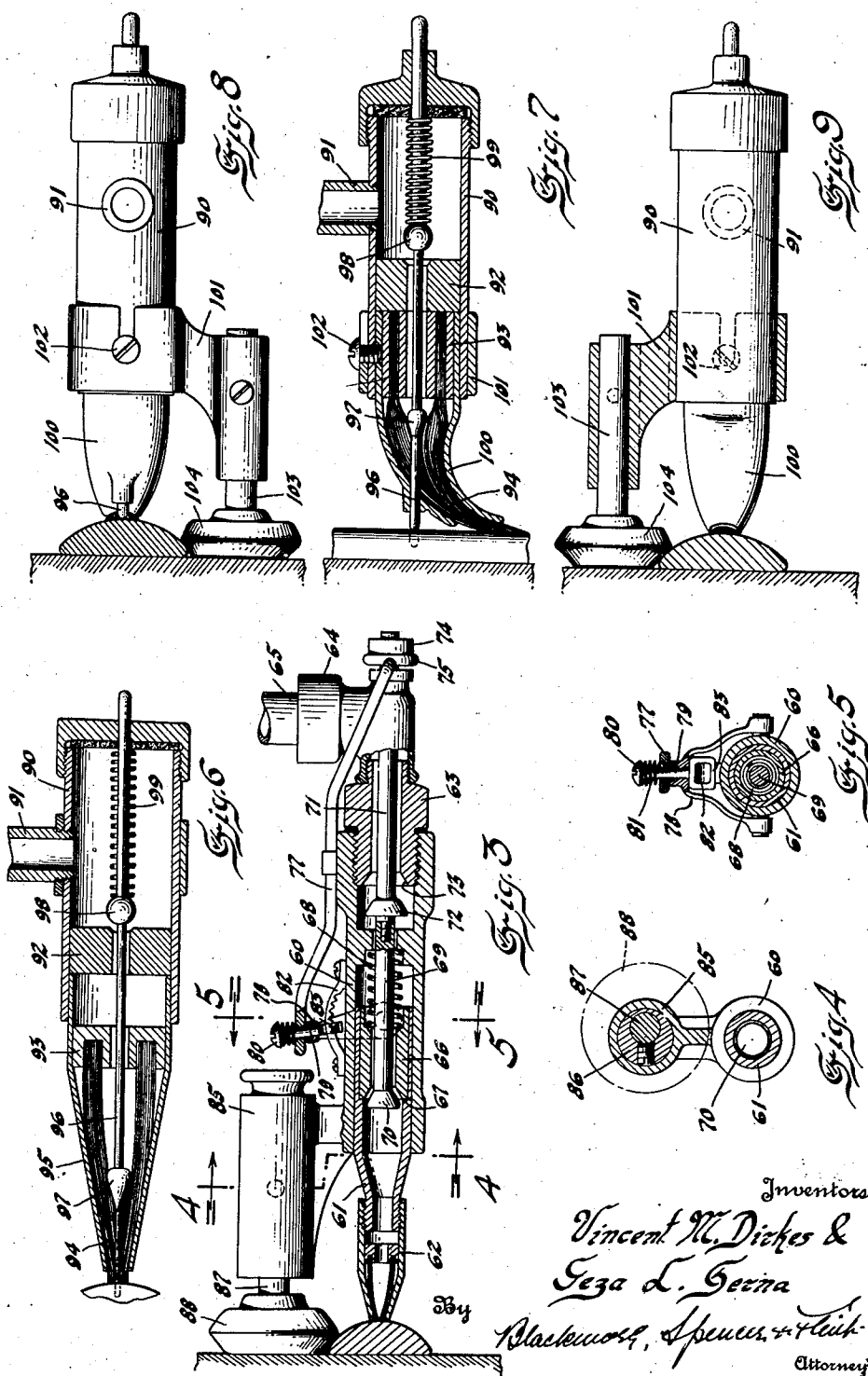
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3 Sheets-Sheet 3

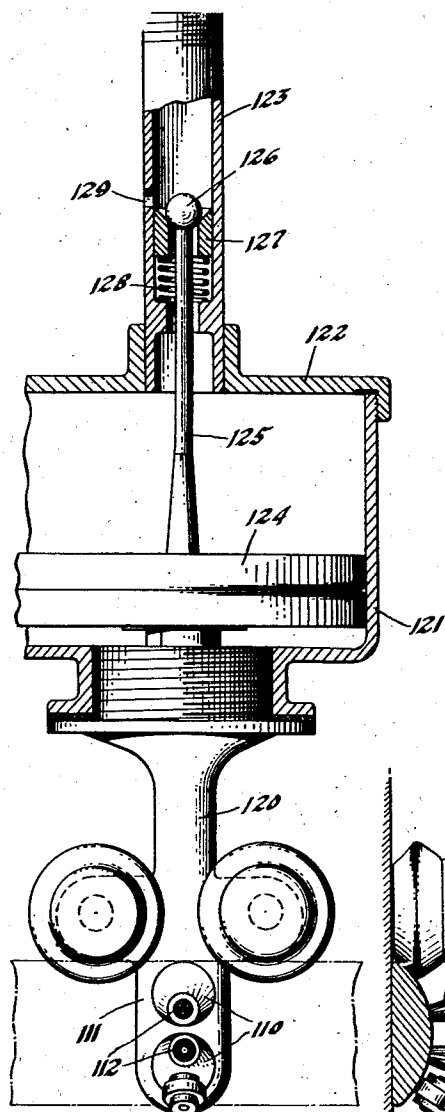


Fig. 11

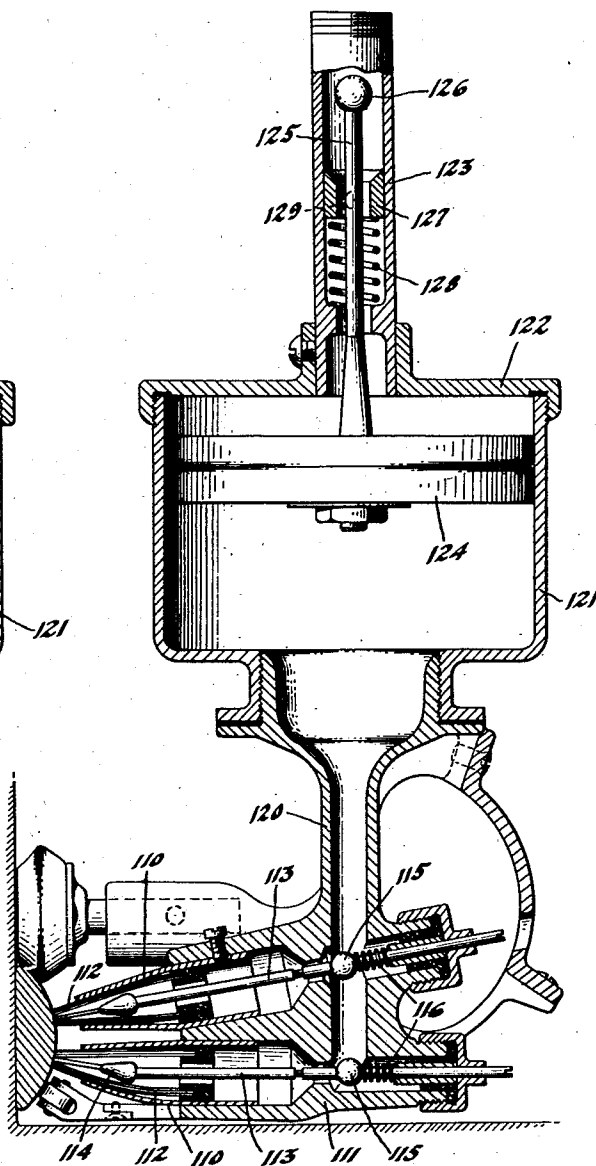


Fig. 10

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UNITED STATES PATENT OFFICE

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STRIPING TOOL

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This invention relates to an instrument for applying a paint line or stripe, and will be found particularly useful in the paint department of automobile body manufacturing plants, where highly paid skilled workmen are now employed to apply ornamental striping with a hand brush.

It is an object of the invention to provide a tool, which in the hands of the ordinary person without any special skill, will apply a uniform stripe, simply in the time required to move the tool over the surface, whereby the striping operation will be reduced to more or less of a mechanical procedure with a material saving in time, labor and cost.

A further object of the invention is to provide a tool which may be guided along the work and will automatically apply the striping material in proportion to the speed at which the tool is moved across the surface to be marked.

Another object is to provide improved valve mechanism for controlling the flow of striping material and which in addition to cutting off the flow at the completion of the striping operation will act to retract the material at the discharge opening and so prevent a blotch at the end of the stripe.

A still further object is to provide an arrangement for replacing the striping material discharged from the tool in a manner to prevent the entrance of air and the formation of air pockets, which, besides impairing the operation of the tool might tend to dry and harden the striping material.

A further object of the invention is to provide a striping device embodying a valve that is automatically opened to allow the flow of striping material when the device is brought into contact with the work.

Various other objects and advantages of the invention will become apparent in the course of the following specification taken in connection with the accompanying drawings, wherein:

Figure 1 is a plan view of a striping tool made in accordance with the invention.

Figure 2 is a section taken on line 2—2 of Figure 1.

Figure 3 is a sectional view illustrating a modified striping tool.

Figure 4 is a section taken on line 4—4 of Figure 3.

Figure 5 is a section on line 5—5 of Figure 3.

Figure 6 is a sectional view of a stripe applying device.

Figure 7 is a section illustrating an alternative form of the device shown in Figure 6.

Figures 8 and 9 are elevations from opposite sides of the device shown in Figure 7.

Figure 10 is a sectional view illustrating a further modification, and

Figure 11 is an elevation partly in section of the tool shown in Figure 10.

Referring to the drawing, the character 1 indicates a cylinder or container in which is movable the piston 2, having an extension or skirt 3, projecting into the domed cover or cap 4 and held against rotation by a key 5, secured to the guide portion 6 of the cap and extending into a way formed in the side of the skirt 3. In the end of the skirt is secured an interiorly threaded bushing 7, with which is engaged the screw 8 formed on a rod or shaft 9 that extends through the bottom wall of the cylinder 1 and has pinned thereon the gear 10, meshing with a worm 11 on the shaft 13. The shaft 13 is journaled in the forks 14, integral with the cylinder 1, and carries a pair of wheels 15 spaced apart so as to engage with the body or work 16 on opposite sides of the molding strip 17, on which the stripe is to be placed. The wheels 15 are preferably provided with rubber tires 18 which serve to frictionally engage the surface of the body 16 and at the same time prevent marring or scratching of the painted surface.

Besides serving as a guide for the tool as it is drawn along the work, the wheels, by their rotation, drive the gearing to move the piston 2 in the cylinder 1, and so cause the discharge of the paint or striping material. As the piston moves in the cylinder, it draws in a new supply of paint behind the piston, through a series of openings 20 in the guide portion 6 of the cap, and through a passage-way in the lateral boss 21 formed on the cap,

to which is secured a valve or cock 22 connecting the interior of the cap with a line 23, leading from a suitable source of paint. Such source of paint is preferably under a slight pressure so that under the combined
 5 action of pressure and piston suction, a positive supply behind the piston is insured.

A passageway 25, formed by a drilled boss or projection at the side of the cylinder, connects opposite sides of the piston 2 and is
 10 provide with a control valve 26 which is closed on the discharge stroke of the piston. When the piston reaches its lowermost limit, the rotation of the wheels 15 is reversed, as
 15 for instance by bringing them in contact with a moving belt or a rotating drum, to retract the piston in the cylinder. During such reversal, the valve 26 is opened and the stop cock 22 is closed, so that the striping material on the inlet side of the piston is forced
 20 through the passageway 25 to the outlet side. Thus, there will be no necessity for opening the cylinder for re-charging, and the possibility of air entering the interior of the tool is eliminated. The travel of the piston to
 25 discharge the striping material being controlled by the rotation of the wheels 15 as the tool is moved along the work, insures a positive even discharge and a uniform stripe throughout the movement regardless of speed.

At the outlet from the cylinder 1 is a socket member comprising the portions 30 and 31 secured to each other by screws or bolts 32 and holding in place a ball member comprising semi-spherical portions 33
 35 and 34 that are clamped together by the socket members about a tubular element 35, within which is slidably positioned a sleeve or plunger 36 having a reduced shoulder portion 37 forming a seat for the tapered end
 40 of the valve stem 38. Secured at one end of the tube 35 is a nozzle 40 and on the other end is a bracket 41, having an arm 42 terminating in an eye 43 surrounding the valve stem 38. Coil springs 44 and 45 interposed
 45 between the eye 43 and collar 46 pinned on the valve stem and the eye 43 and out-turned flange 47 of the sleeve 36, respectively, urge the sleeve and valve stem toward
 50 the nozzle end of the tube. Pivotaly mounted on the arm 42 is a lever 50 having a forked end 51 to engage a collar 52 on the end of the valve stem so that the depression of the lever 50 moves the stem against the tension of its
 55 spring 44 to open the valve and allow the striping fluid to flow through the nozzle onto the work. A set screw 53 serves to limit the movement of the lever 50 to control the amount of striping fluid discharged through
 60 the nozzle for any particular job. The collar 41 also serves as a pivotal mounting for a lever 54 having a forked extremity 55 for engagement with the terminal flange 47 to move the tubular sleeve 36 against the spring 45.
 65 When the valve is open and the tool reaches

the end of the stripe the lever 50 is released to close the valve and at the same time the lever 54 is depressed to move the sleeve 43 and with it the valve stem 38, thereby causing a suction or pump like action at the
 70 nozzle end to retract any striping material within the nozzle away from the discharge opening and so prevent a blotch or smear at the end of the stripe. The ball and socket joint permits a universal adjustment of the stripe
 75 applying device and by loosening the screws 32, the clamping action of the ball portions 33 and 34 may be relieved so as to allow the axial shifting of the tubular member 35 relative to the ball portions. If desired,
 80 other forms of stripe applying devices may be used with the liquid container or cylinder.

In Figure 3, a cylinder 60 has fitted therein at one end a tubular member 61 on the end of which is removably secured a brush holder
 85 62 for applying the stripe to the molding, and at the other end of which is secured a coupling 63 having attached thereto an elbow fitting 64 connected by a pipe or conduit 65 with a suitable source of striping material
 90 under pressure. Within the tube 61 is a slidable sleeve 66 that is held against a shoulder 67 in the tube 61 by a coil spring 68. Extending through the sleeve 66 is a stem 69 having a conical valve head 70 adapted to seat on the end of the sleeve and which is
 95 secured to the end of a stem 71 that is also provided with a valve head 72 having a conical seat 73 formed in the end of the coupling 63. The end of the stem 71 extends through the
 100 fitting 64 and is provided with a collar 74 for engagement with an eye 75 on the end of a link 77. A forked lever 78 pivoted at the sides of the cylinder 60 carries a stem 79 that projects through the end of the link 77
 105 and is provided with a nut 80 at its upper end to hold in place a coil spring 81, that tends to move the stem 79 upwardly. Extending through an eye in the bottom of the stem 79 is an arcuate rack 82 into the teeth
 110 of which the wedge shaped portion 83 of the eye is adapted to extend to hold the lever in certain positions of adjustment to which it may be moved.

Projecting laterally from one side of the
 115 cylinder 60 is a tubular member 85 in which is rotatable a bushing 86 carrying a shaft 87 located off center or to one side of the axis of rotation of the bushing 86. On the end of the shaft 87 is rotatably mounted a guide
 120 wheel or roller 88 for engagement with the molding strip to be striped. The off center relation of the shaft 87 and bushing 86 permits an adjustment of the roller with respect to the brush holder to accommodate different
 125 types of work.

When the valves 70 and 72 are moved off their respective seats as shown in Figure 3, the paint or other striping material flows
 130 freely through the tool to the surface to be

striped. When it is desired to cut off the flow the stem 79 is depressed to allow the lever to be swung, the link 77 transmitting such movement to the valve stems which first causes the head 70 to seat, the continued movement of the stems sliding the sleeve 66 against the tension of the spring 68, until the valve head 72 is seated. The initial seating of the valve head 70 and the subsequent movement of the sleeve 66 serves to retract any paint from the discharge openings to prevent blotching as in the manner previously described.

In the construction shown in Figure 6, the striping material enters the container 90 under pressure through a conduit 91 and flows through central openings in the ring 92 and ring 93 and on through the brush bristles 94, secured in the ring 93 and held by the conical member 95, onto the surface to be striped. A stem 96 extends through the container and out the lower end thereof, and carries a bulb or enlargement 97, that is adapted to squeeze together or compress the fibres of the brush, and also a ball 98 that seats against the end of the ring 92. When the ball 98 is on its seat and the bulb 97 is compressing the brush bristles, no paint can flow through the device, but since the end of the stem projects through the open bottom of the container, it will contact with the surface of the work when a stripe is to be made, to move the bulb 97 away from the brush and the ball 98 off its seat against the tension of the spring 99, to allow the passage of paint through the device and the spreading of the paint by the brush.

The device may be provided with a rearwardly curved holder 100 as shown in Figure 7 which will permit the bristles to terminate in a feather edge, and the end of the valve stem 96 to extend through the side of the holder in advance of the brush. The contact of the stem 96 with the work in advance of the brush, will open the valve without the possibility of marring the stripe as it is laid down by the brush. A holder or bracket 101 is shown secured to the casing 90 by a screw 102 for carrying the shaft 103 on which is rotatably mounted a guide roller 104.

A somewhat similar brush arrangement is shown in Figure 10, which also illustrates a device for making two stripes on a molding positioned in a corner. Each brush holder 110 is secured in the head 111 and carries a brush 112. The stem 113 that contacts with the work carries the bulb 114 and ball 115 and opens these valve elements against the tension of the spring 116. The head 111 has an upward extension 120 screw threaded in the bottom of the container 121 that is closed by a screw threaded cap 122. Extending upwardly from the cap 122 is a pipe or conduit 123 connected with a supply of compressed air or other fluid which acts on the top of the

piston 124 to move the piston in the container 121 and force the striping material onto the surface to be striped. The piston has a stem 125 carrying a ball valve 126 at its upper end which is adapted for seating engagement with a ring 127 upon the downward movement of the piston, compressing the spring 128 and uncovering the vent or relief hole 129 in the side of the conduit 123.

Various other modifications may be made as will be apparent to those skilled in the art. We claim:

1. In a striping tool, a container for striping fluid, a movable partition element in the container, an inlet on one side of the partition thru which striping fluid enters upon movement of the partition in one direction, an outlet on the opposite side of the partition through which fluid is discharged upon such partition movement and a passageway connecting the inlet and outlet sides of the partition through which fluid flows upon movement of the partition in the opposite direction.

2. The structure of claim 1 and a valve controlling fluid flow thru the passageway.

3. The structure of claim 1 and valve elements controlling fluid flow thru the passageway, the inlet and the outlet respectively.

4. In a striping tool, a container for striping fluid, a movable partition in said container, an outlet on one side of the partition thru which the striping fluid is discharged upon movement of the partition in one direction, a valve for closing the outlet upon reverse movement of the partition, an inlet on the opposite side of the partition thru which fluid enters upon the discharging movement of the partition, a valve for closing the inlet upon reverse movement of the partition, a passageway providing communication between opposite sides of the partition, and a valve for closing said passageway during the discharging movement of said partition.

5. In a striping tool, a container for striping fluid, a piston in said container, means contacting the work for moving the piston as the tool is drawn along the work to discharge fluid from the container, a source of fluid connected with the container opposite the discharge side of the piston whereby a new charge of fluid enters the container behind the piston as the fluid on the discharge side is being discharged, and a passageway connecting opposite sides of the piston to permit said new charge to enter the discharge side of the piston when said operating means is actuated to reverse the movement of the piston.

6. In a striping tool, a cylinder, a reciprocatory piston therein, an outlet and an inlet for striping material on opposite sides of the piston, a passageway between opposite sides of the piston, and operating means for the piston, the operation being such that the

movement of the piston in one direction discharges striping material in the cylinder on one side of the piston through said outlet and draws in a new supply on the opposite side of the piston thru said inlet and the reverse movement of the piston forces the material on the inlet side thru said passageway to the outlet side of the piston.

7. The structure of claim 6 wherein the operating means includes gearing mechanism that contacts with the work to actuate the piston as the stripe is applied.

8. In a striping tool, a cylinder for striping fluid, a piston therein, operating means for the piston adapted for engagement with the work to move the piston in accordance with the relative movement of the tool and the work, a member for applying the fluid to the work, a plunger therein adjacent the discharge opening, a valve element seating on said plunger to control fluid flow and means to move the plunger and valve in unison to retract striping fluid from the discharge opening.

9. The structure of claim 8 and a ball and socket mounting for said fluid applying member permitting a universal swinging adjustment thereof, and including semi-spherical elements clamped about said member which when separated permit the sliding of the member therethru.

10. In a striping tool, a tubular member having a striping fluid discharge nozzle at its end, a slidable sleeve contained within said member and having a shouldered portion at one end, adjacent the discharge nozzle, a stem extending thru said sleeve and having a valve portion seating against said shoulder, a lever for moving the valve off its seat and a second lever for moving the sleeve with the valve seated on the shoulder away from the discharge nozzle to retract striping fluid from the nozzle.

11. In a striping tool, a passageway for striping fluid, a movable plunger in said passageway, a valve element having a seat on said plunger and movable relative thereto, to open and close the passageway, and means for moving the plunger and valve in unison to retract fluid in the passageway beyond the valve.

12. In a striping tool, a passageway leading to an opening thru which the striping fluid is discharged, a movable plunger device in the passageway adjacent the discharge opening, a valve having a seat on the plunger, means to move the valve relative to said plunger to permit fluid flow and to seat the valve and move the valve and plunger in unison to create suction in the passageway beyond the valve and retract the striping fluid from said opening.

13. In a striping tool, a passageway leading to an opening thru which the striping fluid is discharged, a movable plunger de-

vice in the passageway adjacent the discharge opening, a valve having a seat on the plunger, means to move the valve relative to the plunger to seat or unseat the valve, and means to move the plunger with the valve seated thereon to retract striping fluid in the passageway beyond the valve and away from the discharge opening.

In testimony whereof we affix our signatures.

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