Jan. 19, 1960 L. J. SCHWARTZ 2,921,555

POCKET MARKING MACHINE

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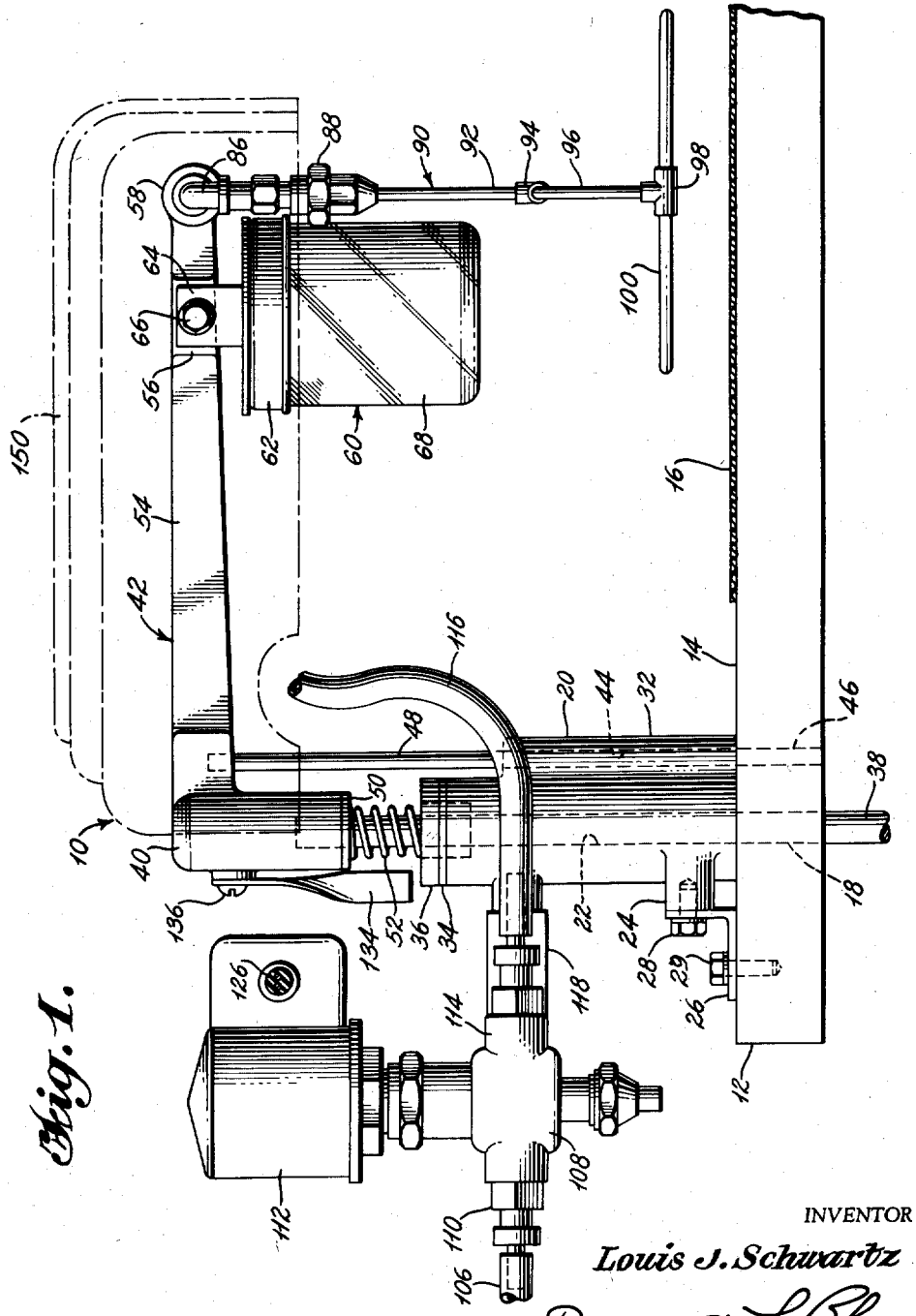


Fig. 1.

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Fig. 2.

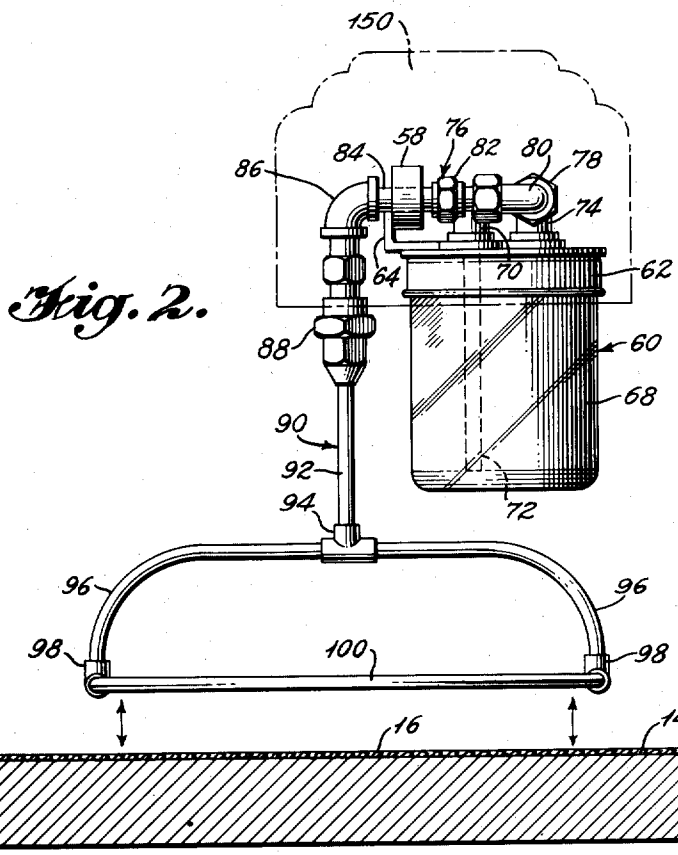
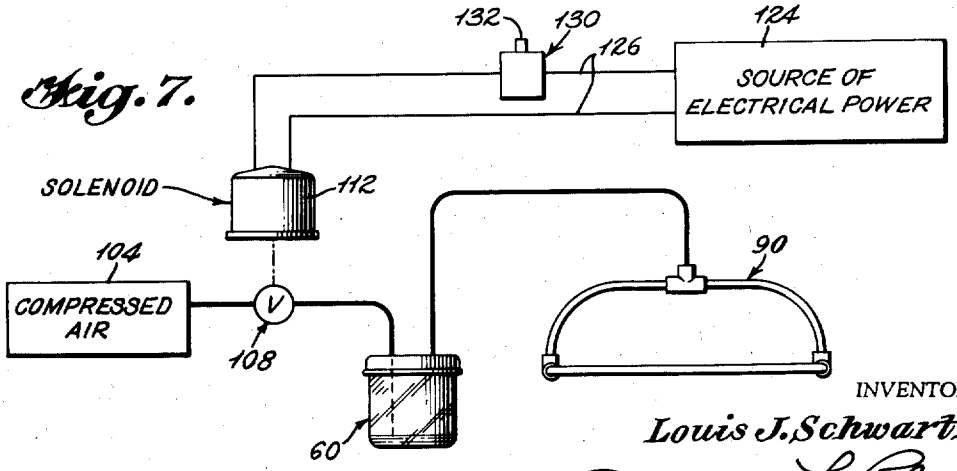


Fig. 7.



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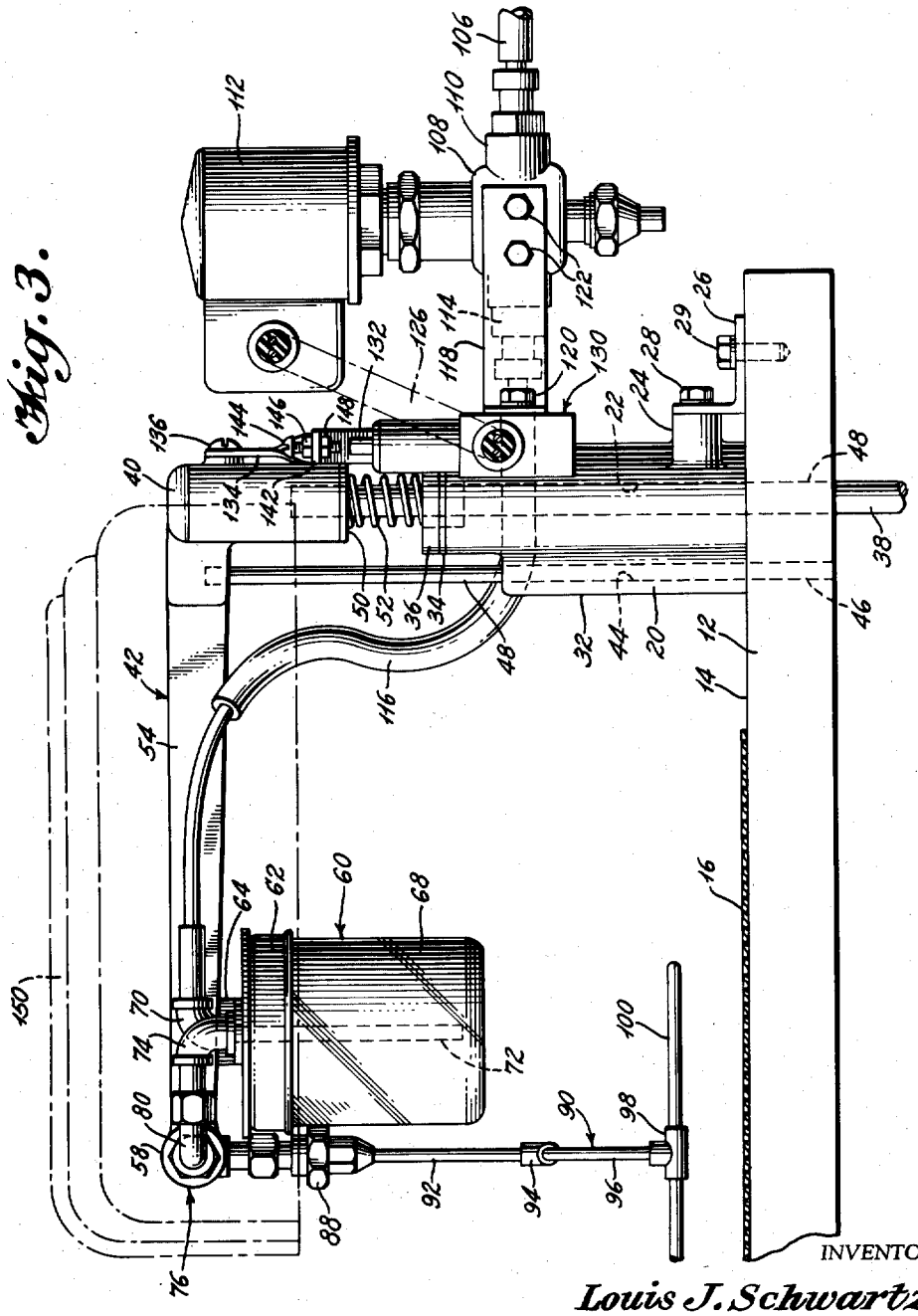
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Fig. 3.



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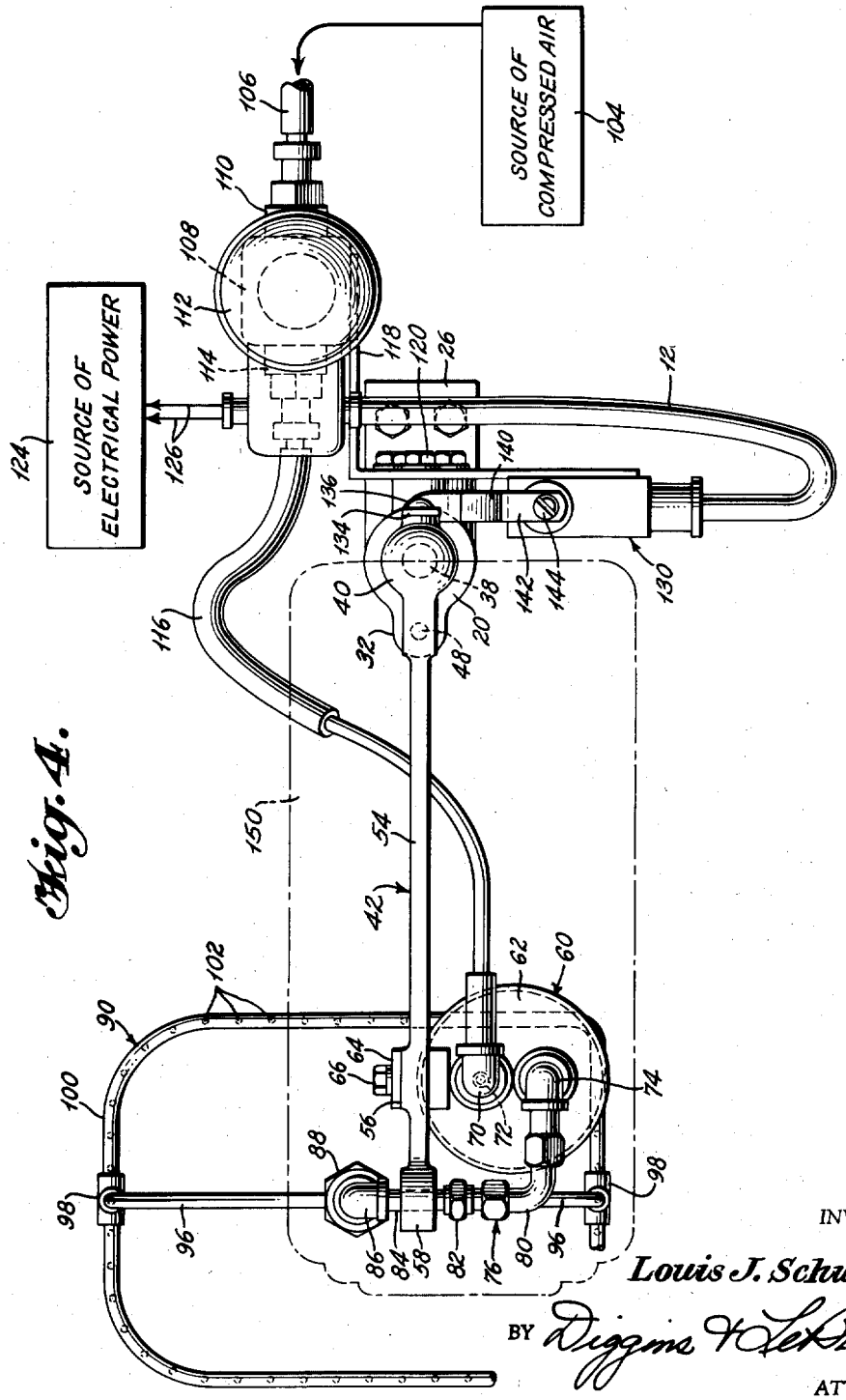


Fig. 4.

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Fig. 5.

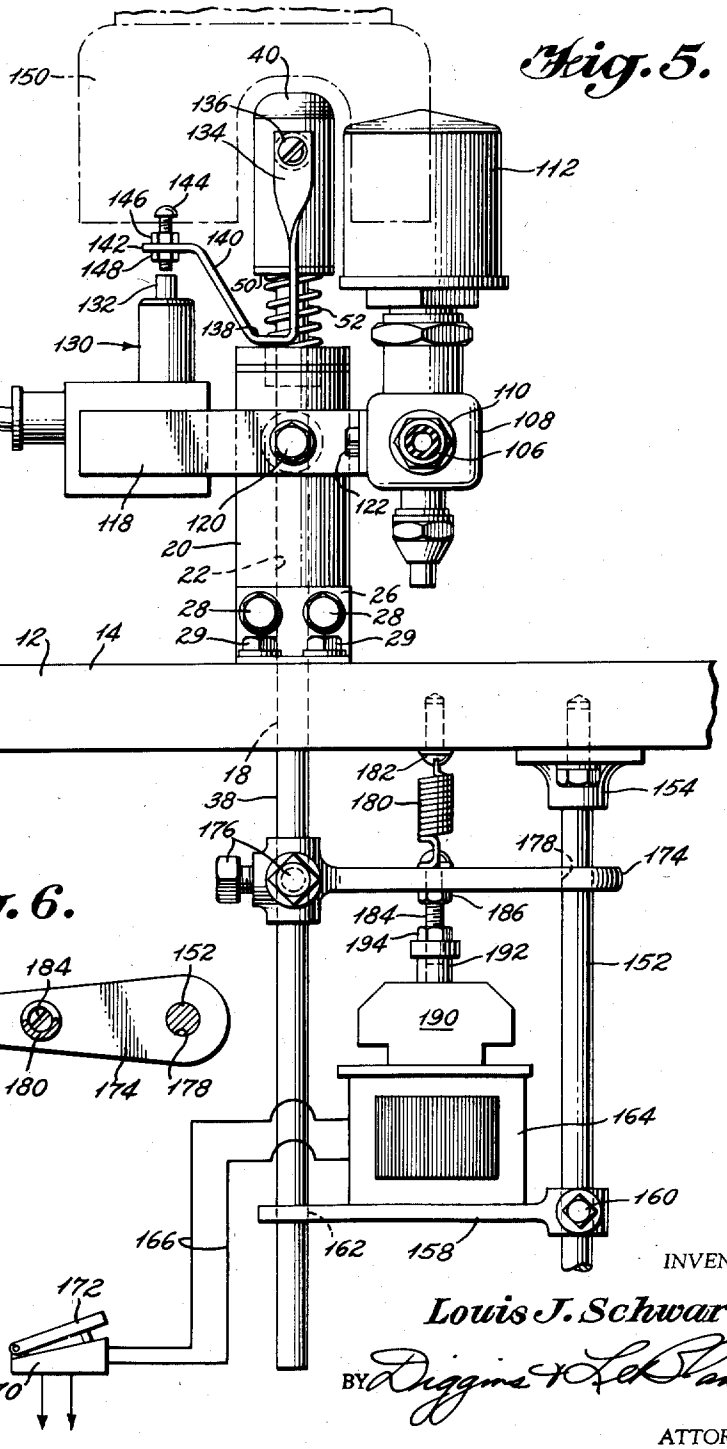


Fig. 6.

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2,921,555

POCKET MARKING MACHINE

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Application July 9, 1957, Serial No. 670,795

4 Claims. (Cl. 118—308)

This invention relates to a pattern marking machine and more particularly relates to a machine for marking a pattern outline of powder on a surface of an element such as a textile fabric.

In the manufacture of clothing it is desirable to have some means for transferring pattern outlines to the material being used. This has been previously been accomplished in a number of different ways, including the use of aerated powder blown onto the material in the desired configuration or marking. It is the purpose of the present invention to provide an improved device for marking material in this manner.

According to the invention, a pattern marking machine is provided having a reciprocable carriage movable toward and away from a support for material being marked, such as a textile fabric or garment. A duct for marking material, such as powder, is secured to the carriage and extends to a position adjacent the textile fabric or garment in the form of a desired pattern outline, such as that of a pocket. Apertures are formed in the surface of the duct adjacent the textile fabric and means is provided for conveying powder to the duct with an entraining gas, such as compressed air. A means is also provided for controlling the flow of powder through the duct to discharge powder from the apertures in the pattern outline at a predetermined point in the movement of the carriage and duct toward the textile fabric. In order to accommodate different thicknesses of textile fabric, an adjustment is provided for varying the point in the movement of the duct and carriage toward the fabric at which the powder is discharged from the apertures in the duct.

In the application of a pattern outline of powder to a textile fabric, it is desirable that the duct from which the powder is discharged against the textile fabric uniformly contact the fabric around the entire pattern outline, so that a uniform marking will be achieved. Therefore, according to the invention, a marking machine is provided having a reciprocable carriage which moves into contact with the fabric to be marked and has guide means for assuring that the movement of the carriage and duct is rectilinear, so that the plane of the pattern outline portion of the duct will remain parallel to the plane of the fabric support and the fabric thereon.

In order that a proper amount of powder will be discharged on to the textile fabric, control means is provided for automatically opening and consecutively closing the flow of powder to the pattern duct in response to a single actuation of the control means by the movement of the carriage and duct toward the fabric support. Thus a measured charge of powder is applied to the textile fabric by movement of the carriage toward the fabric support, there being no necessity for a separate actuation to close off the flow of powder to the duct.

The foregoing results are achieved in a unitary pattern marking machine wherein the powder duct, powder reservoir, means for moving the powder duct into engagement with the textile fabric, valve means for controlling the flow of powder to the powder duct, and actuating means for initiating and ceasing the flow of powder to the powder duct at an adjustable point in the cycle of operation of the machine, are combined in a unitary, compact structure.

It is accordingly a primary object of the invention to provide a pattern marking machine for applying a pattern outline of marking material to an element such as a textile fabric or garment.

It is a further object of the invention to provide a pattern marking machine for quickly and efficiently applying a uniform pattern outline to a fabric.

It is a further object of the invention to provide a pattern marking machine having a pattern shape movable into and out of engagement with a fabric to be marked, and having means for discharging marking material through the duct at a predetermined point in the movement of the duct toward the fabric.

It is a further object of the invention to provide a pattern marking machine having a duct for applying marking material which is movable toward and away from a fabric support, and having means for discharging a charge of marking material through the duct at a predetermined point in the movement of the duct toward the support, with provision for adjusting or varying the point of discharge.

A further object of the invention is to provide a pattern marking machine having a support for a fabric to be marked, a duct having a shape of a pattern outline movable toward and away from the fabric support, and means for guiding the movement of the duct to make the movement rectilinear, so that the plane of the pattern outline of the duct is parallel to the plane of the fabric at the moment of discharge of marking material to achieve a uniform marking.

A further object of the invention is to provide a pattern marking machine of the foregoing type in a readily transportable and mountable form.

These and further objects and advantages of the invention will become more apparent upon reference to the following specification and claims and appended drawings wherein:

Figure 1 is an elevation view of one side of a pattern marking machine according to the invention;

Figure 2 is a front elevation view of the pattern marking machine shown in Figure 1;

Figure 3 is an elevation view of the other side of the pattern marking machine shown in Figure 1;

Figure 4 is a top view of the pattern marking machine shown in Figure 1;

Figure 5 is a rear elevation view of the pattern marking machine shown in Figure 1, with the additional showing of the means for moving and guiding the marking carriage;

Figure 6 is a detailed view of one of the guide bars shown in Figure 5; and

Figure 7 is a schematic view of the electric circuit and compressed air flow circuit in the pattern marking machine illustrated in Figure 1.

The pattern marking machine illustrated in the drawings is generally designated by the numeral **10** and includes a support or table **12** having a flat horizontal upper surface **14**. A textile fabric or garment **16** is spread smoothly on the upper surface **14** in position to have a pattern outline marking impressed thereon. The fabric **16** may be moved into position by hand or by automatic machinery, not illustrated.

A carriage base **20** is mounted on the upper surface **14** of the support **12** and has a circular vertical bore **22** formed therein registering with an aperture **18** in support **12**. A mounting extension **24** is formed at the lower end of the carriage base **20** and extends laterally therefrom. The carriage base is fastened to the table **12** by an L-shaped bracket **26** which is bolted to the extension **24** by bolts **28** and to the table by bolts **29**.

A vertical carriage shaft 38 extends upwardly through the aperture 18 in the support or table 12 into the bore 22 in the carriage base 20. This shaft extends out of the top of the carriage base and has a washer 34, disc 36 and coil spring 52 mounted thereon for a purpose presently to be described. In order to further guide the carriage and prevent its swinging about carriage shaft 38, the carriage base 20 is provided with an extension 32 extending up the side of the carriage base opposite from the carriage base mounting extension 24. This extension has a bore 44 therein which mates with an aperture 46 in the support or table 12. A vertical guide rod 48 extends through this bore and aperture and out of the top of the carriage base 20.

The carriage shaft 38 carries at its upper end a carriage bracket 40 which receives the upper end of the guide rod 48. The underside 50 of the bracket 40 rests upon and is supported by the coil spring 52.

A cantilever arm 54 is secured to carriage bracket 40, as by being cast integrally therewith, and extends horizontally therefrom. The cantilever arm has as intermediate mounting extension 56 formed adjacent the outer end thereof and terminates in an apertured ring 58.

A powder reservoir generally designated 60 is secured to the cantilever arm 54 and includes a cast iron lid 62 having an upwardly extending lug 64 secured to the intermediate mounting extension 56 by means of a bolt 66. A powder jar 68, preferably of unbreakable glass, is secured within iron lid 62, as by screw threads, and is adapted to contain powdered marking material, such as starch or chalk.

In order to deliver compressed air to powder reservoir 60, the lid 62 is provided with an L-shaped inlet 70 attached to a tube 72 extending downwardly to a point adjacent the bottom of jar 68. For the passage of a mixture of air and powder from the reservoir 60, an L-shaped outlet 74 is mounted in lid 62. The outlet is connected to a conduit, generally designated by numeral 76 and including a connecting fitting 78, an elbow 80, a fitting 82, a straight pipe section 84 extending through the aperture in end ring 58, and an elbow 86 with its vertical portion connected to a fitting 88.

Secured to the lower end of fitting 88 is a powder duct generally designated by the numeral 90 which includes a hollow vertical portion 92, a T-fitting 94, two downwardly curved connecting tubes 96, two T fittings 98, and a pattern outline conduit 100 lying in a horizontal flat plane. This outline conduit has the shape of the desired pattern outline, in this case that of a pocket. Spaced apertures 102 are formed in the lower surface of pattern conduit 100 for the passage of powder into contact with the textile fabric 16 to imprint the pocket outline on the fabric.

In order to supply compressed air to powder reservoir 60, a source of compressed air 104 is provided, as seen in Figures 4 and 7 which supplies air through hose 106 to normally-closed, electrically-openable valve 108. The valve is of a conventional type having an actuating solenoid 112, inlet 110 and outlet 114. The valve is spring biased to a closed position and is opened upon energization of solenoid 112. The valve outlet 114 is connected to a hose 116 connected to the powder reservoir inlet 70. The valve 108 is secured to the carriage base 20 by an L-shaped bracket 118 and bolts 120 and 122.

Power is supplied to solenoid 112 from a source 124 over cable 126. The circuit is controlled by a microswitch 130 including conventional timing means, which microswitch is secured to bracket 118 and has an operating button 132 extending upwardly therefrom. The microswitch 130 is of a conventional construction wherein the operating button is normally spring-pressed upwardly to an open circuit position and closes and opens the circuit upon a single depression of the operating button.

In order to close the electrical circuit to solenoid 112, actuating means is mounted on the carriage 42 and includes a vertical plate 134 secured by a bolt 136 to bracket 40. The plate has attached thereto a horizontal extension 138, a diagonal extension 140 and a horizontal mounting plate 142 having a screw-threaded aperture therein. An actuator set screw or bolt 144 is screw-threaded in position in plate 142 and is held in the desired position by lock nuts 146 and 148. In order to protect the entire carriage 42, a cover 150 may be provided as shown in dotted lines in the drawings.

The carriage 42 is moved downwardly by an electromagnetic arrangement shown in Figure 5. Referring to that figure, a guide rod 152 parallel to and spaced from carriage shaft 38 depends from the lower surface of table 12, to which it is attached by flange 154. A lower horizontal guide bar 158 is adjustably secured to vertical guide rod 152 by a set screw 160 and is apertured at 162 to slidably receive carriage shaft 38. An electrical solenoid 164 is rigidly secured to lower guide bar 158 and is supplied with electrical current through leads 166 and a suitable source of electrical power. The electrical circuit is controlled by a switch 170 normally spring-pressed to open circuit position and adapted for closure by depression of foot treadle 172.

An upper guide bar 174, shown in detail in Figure 6, is adjustably mounted on carriage shaft 38 by set screws 176 and has an aperture 178 formed therein slidably receiving vertical guide rod 152. A tension coil spring 180 extends between upper guide bar 174 and the lower surface of table 12 to which it is secured by an upper bolt 182. An elongated lower bolt 184 secures the spring to the guide bar 174 and extends beneath the guide bar 174. A nut 186 threaded on lower bolt 184 firmly positions the bolt on the upper guide bar 174. An armature 190 is suspended within the solenoid 164 and has a connecting extension 192 formed on the upper surface thereof into which the lower bolt 184 is threaded. A lock nut 194 on bolt 184 insures a firm positioning of the armature.

When the pattern marking machine is in a rest position as illustrated in Figure 5, the tension spring 180 and the compression spring 52 hold the carriage 42 in its uppermost position, the armature 190 being partially outside of the solenoid 164.

The operation of the illustrated pattern marking machine will now be described. A textile fabric, such as a garment 16, is spread on the upper surface of table 12 beneath the pattern duct 100 in a position so that the duct will contact the garment at the desired position for marking. Thereafter, the operator depresses foot treadle 172 supplying electrical current to solenoid 164. The armature 190 is thus magnetically drawn downwardly causing downward movement of upper guide bar 174, carriage shaft 38 and the entire carriage 42. Thus the tension spring 180 is extended under a tensile stress and the compression spring 52 compressed under a compressive stress.

As the shaft 38 moves downwardly, it will be seen that the parallel guide bars 158 and 174, sliding with respect to shaft 38 and guide rod 152, respectively, cooperate to insure that the vertical movement of shaft 38 and carriage 42 is rectilinear. Thus, when the pattern duct 100 moves downwardly to a position adjacent the garment 16, its plane is parallel to the garment and it contacts the garment with uniform pressure around its periphery. As a result, a uniform marking of the garment is achieved without blurring any portions of the pattern outline.

When the carriage 42 reaches a position in its downward movement where the pattern duct 100 is adjacent the fabric 16, the actuator set-screw 144 contacts operating button 132 of microswitch 130. Thereafter, the electrical circuit to solenoid 112 is automatically closed to open valve 108 for a predetermined interval of time, permitting the charge of compressed air to pass through the valve from compressed air source 104 through hose 116

to reservoir inlet **70**. The charge of compressed air passes downwardly through tube **72** into jar **68** and entrains therein a portion of chalk or starch powder. The mixed charge of powder and air passes outwardly through outlet **74**, hollow conduit **76** to powder duct **90** and pattern duct portion **100**, where it leaves via apertures **102** to apply a uniform pattern outline of a pocket to the fabric **16**. Thereafter, microswitch **130** effects an automatic opening of the electrical circuit to solenoid **112** to close valve **108** after the measured charge of compressed air has passed through the valve. It will be seen that in order to accommodate different thicknesses of fabric or garment **16**, the point in the downward movement of the carriage **42** at which the charge of powder is discharged from the powder ducts **102** may be adjusted or varied by moving the set screw **144** upwardly or downwardly with respect to the mounting plate **142**.

After the foregoing application of a pattern outline to the garment **16**, the operator releases the pressure on treadle **172**, opening the electrical circuit to solenoid **164**. The armature **190** is thus released from magnetic attraction and the compression spring **52** and the tension spring **180** cooperate to raise the carriage **42** to its uppermost position. The fabric **16** may then be moved to a position where another portion of it may be marked or another garment may be placed in position to be marked.

Thus it is seen that the invention provides a pattern marking machine wherein the means for applying marking powder to a fabric, powder reservoir, means for impelling the powder to a discharge point, and means for actuating the discharge of powder onto a fabric are combined in a unitary device. Further, it is seen that the invention provides a pattern marking machine having a movable carriage whose point of powder discharge may be adjusted to accommodate various thicknesses of fabric.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by the United States Letters Patent is:

1. A marking machine for applying a pattern outline of powdered material to the surface of an element, said machine comprising a base, a marking carriage mounted for reciprocation toward and away from said base, a duct secured to said carriage and extending away from said carriage, the portion of said duct farthest from said carriage having a plurality of apertures positioned in the shape of a pattern outline, electrical solenoid drive means connected directly to said carriage for reciprocating said carriage toward and away from said base, a powder reservoir mounted on said carriage, and having an outlet and an inlet, a hollow conduit extending from said reservoir outlet to said duct, means for delivering compressed gas to said reservoir inlet, a valve controlling said gas delivering means and normally preventing said gas delivery, means for opening said valve to permit said gas delivery, means for actuating said valve opening means, said actuating means being mounted on said carriage to actuate said valve opening means at a predetermined point in the movement of said carriage toward said base.

2. A marking machine as set forth in claim 1 including means for consecutively opening and closing said valve in response to a single actuation by said actuating means occurring during the downward movement of said carriage.

3. A marking machine for applying a pattern outline of marking material to a surface of an element, said machine comprising a support for an element to be marked, said support having an aperture extending therethrough, a marking carriage mounted above said support and having a supporting shaft extending through said aperture for reciprocation within said aperture, a duct for marking material secured to said carriage and extending downwardly therefrom, the lower portion of said duct having a plurality of spaced apertures in the shape of a pattern outline in a plane substantially parallel to the upper surface of said support, the lower surface of said pattern portion of said duct being apertured in the shape of said pattern outline, means for supplying marking material to said duct, said vertical carriage shaft extending beneath said support, a vertical guide rod fixedly mounted beneath said support and extending parallel to said vertical carriage shaft, a first guide bar having one end fixed to said vertical carriage shaft, the other end of said first guide bar having an aperture formed therein through which said vertical guide rod slidably extends, a second guide bar having one end fixed to said vertical guide rod, the other end of said second guide bar having an aperture formed therein through which said vertical carriage shaft extends, and electromagnetic drive means supported by said guide rod and said shaft and operatively connected to said shaft for vertically reciprocating said vertical carriage shaft and carriage.

4. A marking machine for applying a pattern outline of powder to a textile fabric, said machine comprising a horizontal support for a textile fabric, a base secured to said support, said base and said support having vertical apertures extending therethrough in registry with each other, a carriage mounted above said base and having a vertical shaft extending downwardly through said apertures for vertical reciprocation in said apertures, a carriage bracket secured to the upper end of said vertical shaft, said bracket forming a shoulder surrounding said shaft, a coil spring surrounding said vertical shaft and extending between said base and said shoulder to urge said carriage upwardly, a cantilever arm secured to said carriage bracket and extending laterally over said fabric support, a duct for powder secured to the outer end of said cantilever arm and extending downwardly therefrom, the lower portion of said duct having a horizontal shape of a pattern outline, said pattern portion of said duct having spaced holes formed in its lower surface, a powder reservoir secured to said cantilever arm between said powder duct and said carriage bracket, a powder outlet formed in said reservoir, a hollow conduit extending from said powder outlet to said powder duct, a compressed air inlet formed in said reservoir, a source of compressed air, a hollow connection extending from said air source to said reservoir inlet, a normally-closed electrically-openable valve in said connection, an electrical circuit to said valve connected to a source of electrical power, a switch in said electrical circuit mounted adjacent said machine base and having a movable operating button extending outwardly therefrom, a switch actuator mounted on said carriage and extending adjacent said switch button to contact said button when said carriage is moved downwardly, a solenoid armature secured to the lower portion of said vertical shaft, a solenoid coil surrounding said armature and fixedly mounted with respect to said fabric support, an electrical circuit for energizing said solenoid coil to draw said carriage downwardly.

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