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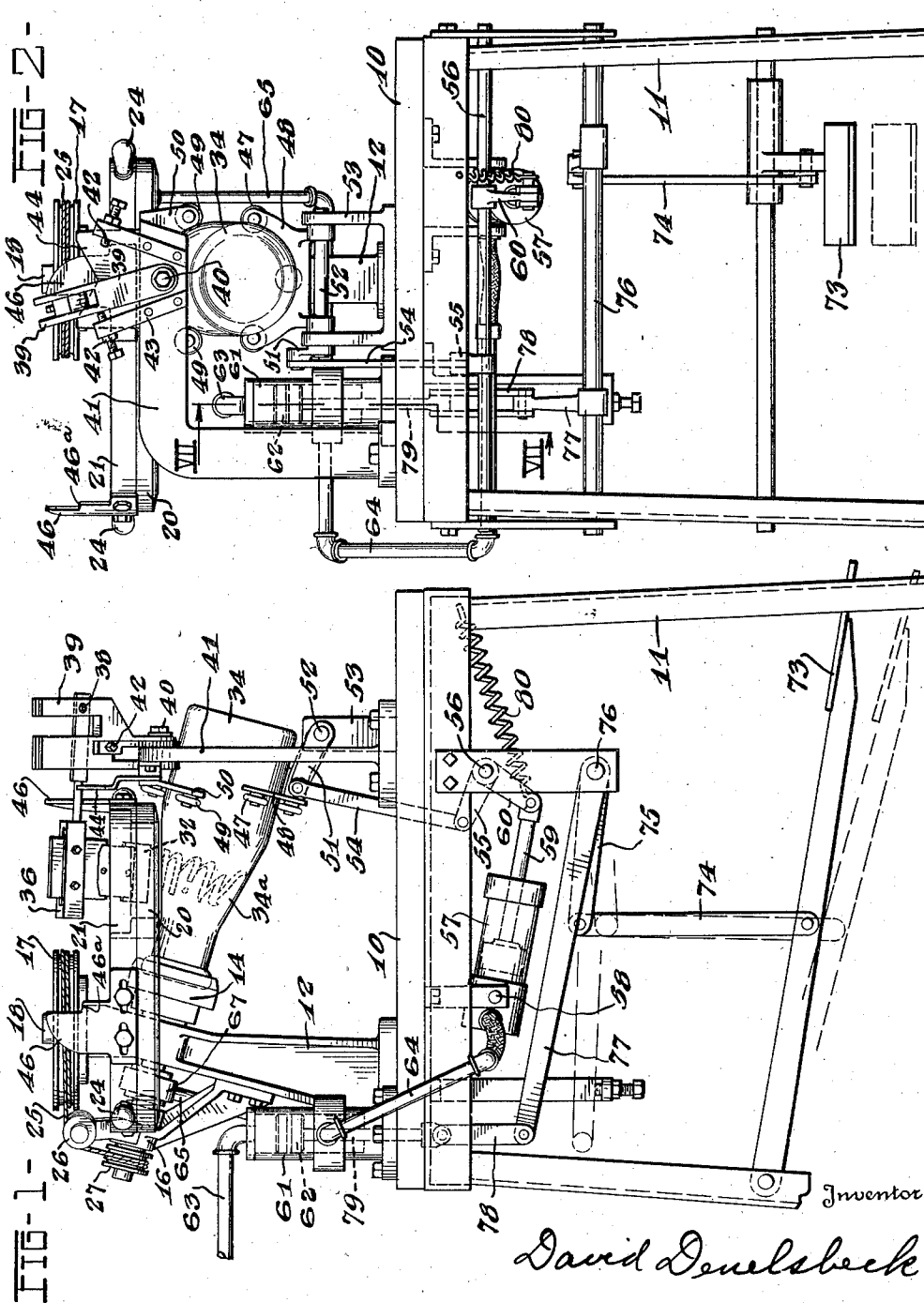
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2,111,207

APPARATUS FOR MARKING OR DECORATING ARTICLES

Filed Dec. 30, 1933

3 Sheets-Sheet 1



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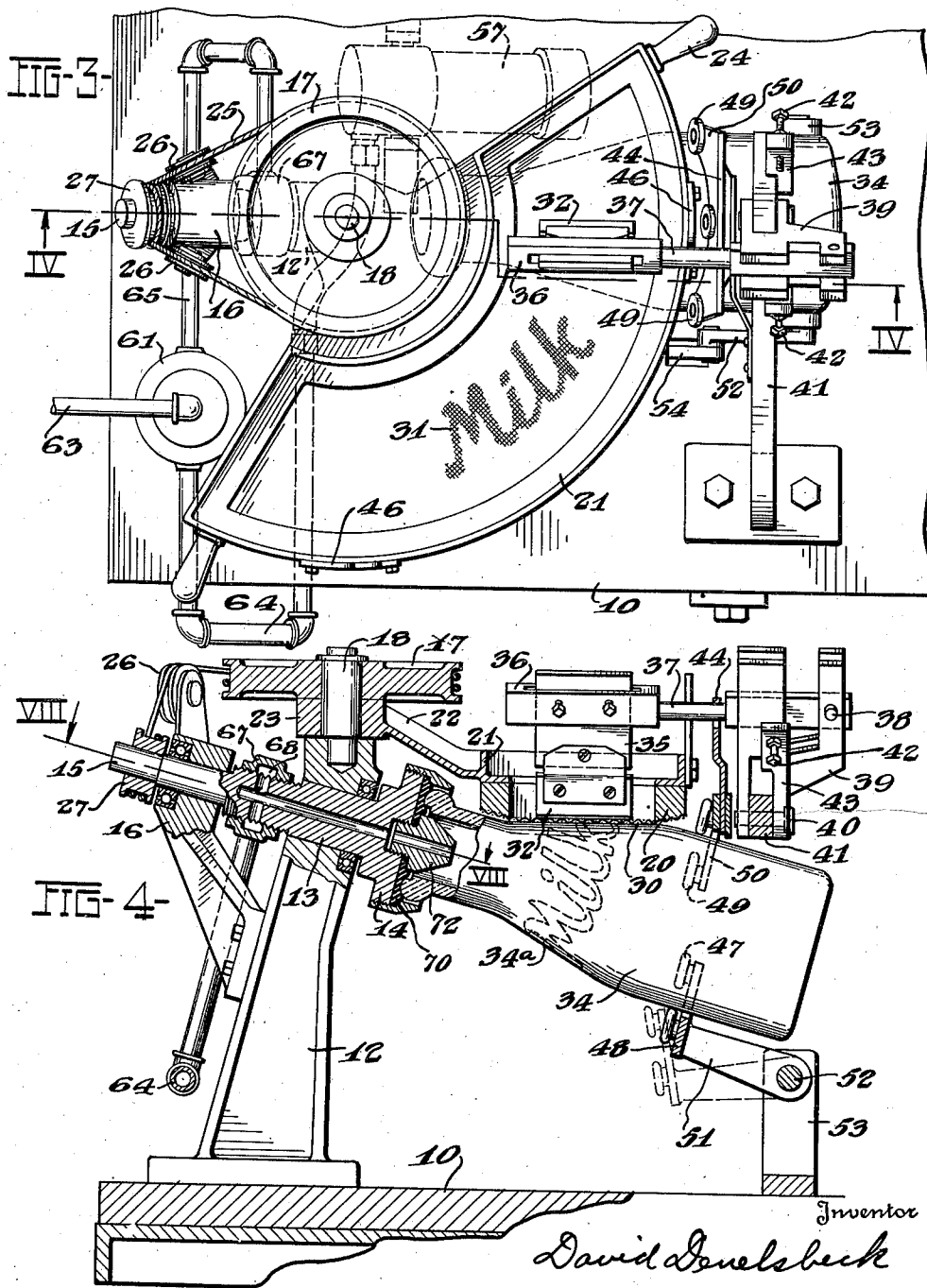
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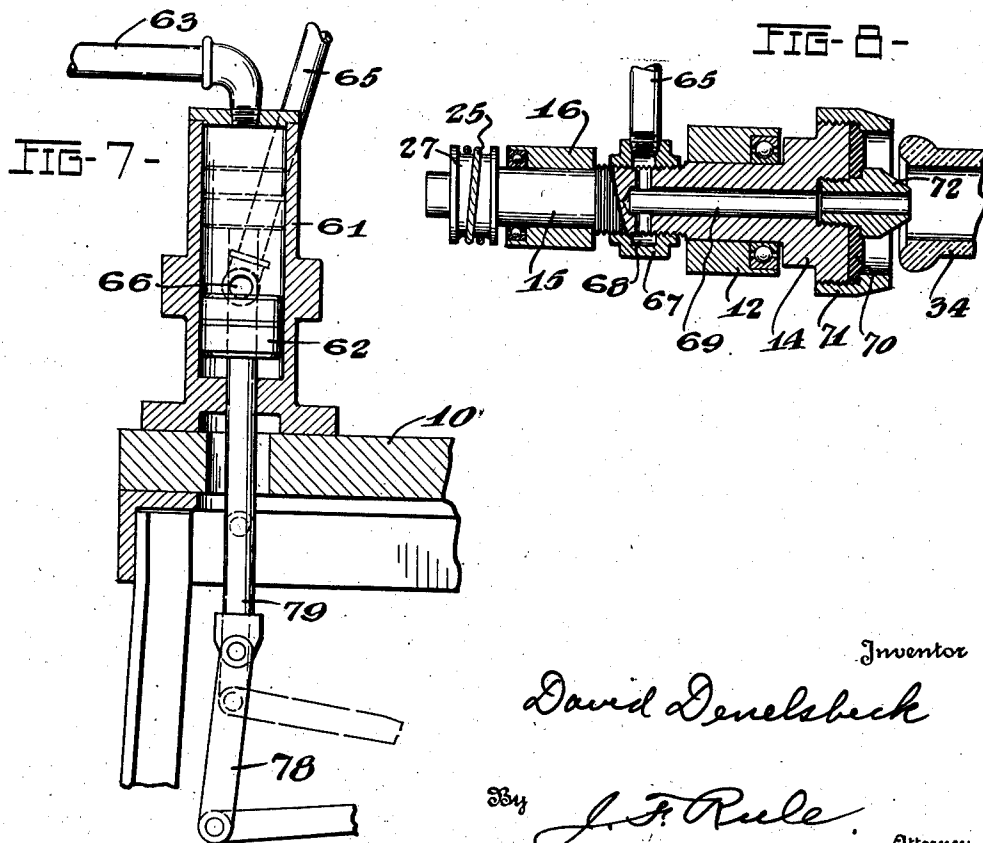
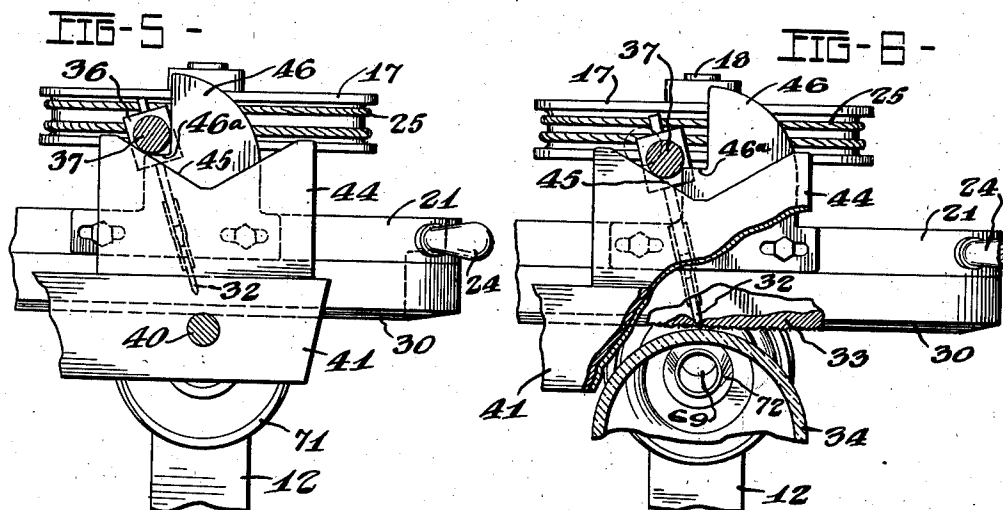
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APPARATUS FOR MARKING OR DECORATING ARTICLES

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3 Sheets-Sheet 3



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APPARATUS FOR MARKING OR DECORATING ARTICLES

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Application December 30, 1933, Serial No. 704,657

8 Claims. (Cl. 101—124)

My invention relates to apparatus for marking, lettering or decorating surfaces of various articles and in its preferred form relates particularly to apparatus designed for marking or ornamenting surfaces by a stenciling method. The invention as herein illustrated is adapted for use in decorating frusto-conical surfaces such as the tapered or shoulder portions of milk bottles or other bottles or articles of similar shape.

The present application discloses a stenciling apparatus similar in many respects to that disclosed in my copending application Serial No. 698,396 filed November 17, 1933, Method and apparatus for decorating articles, the present application disclosing certain subject matter claimed in said copending application.

An object of the present invention is to provide improved means for holding a bottle or other hollow article during the decorating operation and more particularly to provide means for holding the article by suction to the chuck by which it is rotated. The invention also provides means operated by a suction motor for supporting the bottle or article near its base. A further object of the invention is to provide improved means for automatically reversing the squeegee.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings:

Fig. 1 is a side elevation of the decorating or stenciling machine.

Fig. 2 is a front elevation of the machine.

Fig. 3 is a fragmentary top plan view of the machine.

Fig. 4 is a part sectional side elevation, the section being taken at the line IV—IV of Fig. 3.

Fig. 5 is a part sectional front elevation of the squeegee and its lifting and reversing mechanism.

Fig. 6 is a similar view showing the parts in a different relative position.

Fig. 7 is a fragmentary sectional elevation of the vacuum valve and adjoining parts.

Fig. 8 is a sectional view of the vacuum operated chuck.

The machine is mounted on a platform or table 10 supported on a framework 11. A standard 12 bolted to the platform 10 is formed with a journal bearing 13 in which is rotatively mounted a chuck 14. The chuck is provided with a stem 15 which has bearings in a bracket 16 bolted to the standard 12. A horizontally disposed driving wheel or pulley 17 has fixed thereon a pivot pin or spindle 18, the lower end of which is journaled in the standard 12.

A screen frame 20 is attached to the lower surface of a horizontal carrier 21. The screen frame and its carrier are segmental in form and are designed to be oscillated about the vertical axis of the pivot pin 18. For this purpose the carrier is provided with a web 22 and a hub 23 through which the pivot pin 18 extends, said hub having a fixed connection with the wheel 17. The carrier 21 may be oscillated by means of handles 24. An endless cable 25 is wound around the pulley 17 and extends over guide pulleys 26 and a sheave or pulley 27 keyed to the stem 15 of the chuck. It will be seen that with this construction, when the screen carrier 21 is oscillated, the motion is transmitted through the cable 25 and positively rotates the chuck.

Attached to the screen frame 20 is a silk screen 30 or other conventional or approved screen. Said screen may have applied thereto a sheet or coating of impervious material in which is stenciled or cut the design 31. The squeegee or wiper blade 32, made of rubber or like material, is mounted above the screen and held thereagainst while the screen is moved horizontally, said wiper serving to force ink or coloring material 33 (Fig. 6) through the stenciled portion of the screen for applying the design 31 to the surface of a work piece or article 34, herein shown as a bottle.

The bottle 34 includes a tapered or shoulder portion providing a frusto-conical surface 34^a to which the decoration is applied. When the bottle is in position on the machine, the screen is tangent to this surface, making contact therewith along a horizontal line. The parts are preferably so arranged that the vertical axis of the pivot pin 18 intersects the axis of rotation of the bottle at or near the apex of the cone of which the portion of the bottle to be decorated is a frustum. The parts are also so proportioned that the surface 34^a is positively rotated at the same surface speed as the screen where it contacts with said surface. This arrangement of parts and operation insures rolling contact between the bottle and screen without any relative sliding movement which would interfere with the perfect transfer of the stencil design to the bottle.

The blade 32 is attached to the lower end of a plate 35, which extends upward through a slot in a head 36 on a horizontal arm 37. The arm 37 is connected at its outer end by a pivot 38 to a yoke shaped supporting arm or carrier 39, the latter connected by a pivot 40 to a standard 41 mounted on the platform 10. The arm 39 is

adapted to oscillate through a limited arc determined by adjustable stops 42 on arms 43 fixed to the standard 41.

A stationary cam plate 44 mounted on the standard 41, is formed with inclined cam surfaces 45 on which the arm 37 is adapted to ride for lifting the squeegee away from the screen at the end of each operating stroke as hereinafter described. The yoke 39 which carries the squeegee is rocked about its pivot 40 for reversing the squeegee, by means of reversing lugs or plates 46 mounted on the carrier 21 in position to engage the arm 37 as the screen carrier approaches the end of its operating stroke, as more fully described hereinafter.

The article 34 which is to be decorated, herein shown as a milk bottle, is held on the chuck 14 by means of vacuum or suction as will be presently described. It is further supported by lower rolls 47 carried on a yoke 48 in position to engage the lower surface of the bottle, and upper rolls 49 carried on the stationary yoke 50 in position to engage the upper surface of the bottle opposite the rolls 47. The yoke 48 is mounted on a rock shaft 52 journaled in a stationary bracket 53. A rock arm 51 on the shaft 52, is connected through a link 54 to a rock arm 55, on a horizontal rock shaft 56. A piston motor 57 is mounted beneath the platform 10 to oscillate about pivots 58 and has its piston 59 connected to a rock arm 60 on the shaft 56.

A vacuum valve 61 comprises a cylindrical valve casing mounted on the platform 10 and a valve piston 62 mounted to reciprocate in said casing. A vacuum pipe 63 connects said valve with any suitable source of vacuum (not shown). A pipe line 64 extends from the valve to the piston motor 57. A pipe 65 opening into the valve through a port 66 (Fig. 7) provides a vacuum line leading to the chuck 14. The pipe 65 (see Fig. 8) is connected to a collar 67 threaded on the stem 15, said collar having an annular recess 68 providing communication between the pipe and a central bore or channel 69 extending through the chuck. A rubber gasket 70 is removably secured to the chuck by means of a collar 71 and provides a seat for the end or lip of the bottle 34. The latter is guided into position on the chuck by a removable tapered head 72 threaded in the chuck.

The valve 62 is operated by means of a foot pedal 73 connected to the valve through a link 74, rock arm 75, rock shaft 76, rock arm 77, and link 78, the latter pivoted to the valve stem 79.

Operation

The operation may be described as follows: Assuming the screen carrier 21 has been moved to the left to the end of its travel as shown in Fig. 3, a bottle is placed in position with the open end thereof against the chuck. The operator now depresses the foot pedal 73 thereby lowering the valve piston 62 (Fig. 7). This uncovers the port 66, thereby establishing communication between the vacuum pipe 63 and the pipe 65 which leads to the chuck. The air is thus exhausted from the bottle so that the latter is securely held by suction on the chuck. The downward movement of the valve piston 62 also opens the valve to the pipe 64 leading to the piston motor 57 so that the latter operates to lift the yoke 48. This brings the rolls 47 into supporting contact with the bottle and also holds the bottle against the upper rolls 49. The bottle is thereby firmly held in line with the axis of rotation of the chuck. While the bottle is thus

being placed in position the squeegee is held in the Fig. 5 position, spaced above the screen, the arm 37 being supported on a ledge 46* formed on the reversing plate 46. The operator by means of the handle 24 now swings the carrier 21 to the right. The initial movement of the carrier withdraws the plate 46 from the squeegee, allowing the latter to drop into engagement with the screen therebeneath, as shown in Fig. 6. As the carrier 21 moves to the right, the pulley 17 is rotated and the motion transmitted to the bottle so that the latter is positively rotated and caused to roll along the under surface of the screen as the latter travels. During this movement the squeegee or wiper 32 which is held stationary directly over the line of contact between the screen and bottle surface 34*, operates in the usual manner to force the coloring material 33 through the stencil design and thereby apply the design to said surface. As the screen carrier nears the limit of its movement to the right, the left hand reversing plate 46 engages the squeegee carrying arm 39 and swings it from the Fig. 2 position over to the right into engagement with the right hand stop 42. Before the arm 39 reaches said stop, the cam surface 45 engages the arm 37, and lifts the squeegee, permitting it to be carried over a portion of the coloring material 33 which has piled up in front thereof, preparatory to the next operating stroke. The bottle is released by discontinuing the pressure on the foot pedal. This permits the valve piston 62 to be raised by atmospheric pressure, thereby admitting air pressure to the pipes 64 and 65. Air through the pipe 65 restores the air pressure in the bottle and releases it from the chuck. At the same time air pressure transmitted through pipe 65 to the motor 57 permits its piston to be retracted by a spring 80 which also lowers the bottle supporting yoke 48.

Modifications may be resorted to within the spirit and scope of the appended claims.

What I claim is:

1. In a machine for decorating or marking articles, the combination of a work-holding device, a support on which said device is mounted for rotation, a vacuum line extending to said work-holding device, a valve in said line, means for actuating said valve and applying suction through said line to the work-holding device and thereby causing the latter to hold a work-piece, a suction operated motor for actuating said supporting device, and means controlled by said valve to apply suction to said motor.

2. Apparatus for decorating or marking the surfaces of hollow articles, comprising a chuck mounted for rotation, a piston valve, a vacuum line extending from said valve to the chuck, a foot pedal operatively connected to the valve piston for operating the latter and thereby opening the vacuum line to a source of vacuum and causing a work piece to be held on the chuck by suction, and means for rotating the chuck and the work piece.

3. Apparatus for decorating or marking the surfaces of hollow articles, comprising a chuck mounted for rotation, a piston valve, a vacuum line extending from said valve to the chuck, a foot pedal operatively connected to the valve piston for operating the latter and thereby opening the vacuum line to a source of vacuum and causing a work piece to be held on the chuck by suction, means for rotating the chuck and the work piece, a supporting device for the work piece,

5 a suction motor operable to move said supporting device into position for supporting the work piece, and means controlled by said valve for applying suction to said motor and operating the latter.

10 4. In a machine for decorating or marking articles, the combination of a work-holding device, a support on which said device is mounted for rotation about an inclined axis, pneumatic means for causing the work-holding device to hold a work-piece, a valve controlling said pneumatic means, and means for actuating said valve.

15 5. In a machine for decorating or marking articles, the combination of a work-holding device, a support on which said device is mounted for rotation about an inclined axis, pneumatic means for causing the work-holding device to hold a work-piece, a valve controlling said pneumatic means, means for actuating said valve, a 20 supporting device movable to and from an operative position in which it supports the work-piece in an inclined position for rotation with the work-holding device about said inclined axis, and means controlled by said valve for actuating said 25 supporting device.

6. An apparatus for decorating or marking the surfaces of articles, comprising a work-holding device, a support on which said device is mounted for rotation, means for causing a work-piece to

be held in operative engagement with said work-holding device by differential, pneumatic pressure, a valve controlling the application of said differential pressure, a supporting device for the work-piece, and means controlled by said valve 5 for actuating the supporting device.

7. In a machine for decorating or marking articles, the combination of a work-holding device, a support on which said device is mounted for rotation, a valve, means controlled by the 10 valve for causing a work-piece to be held in operative engagement with the work-holding device by differential, pneumatic pressure, a supporting device for the work-piece, a motor for actuating the supporting device, and means controlled by said valve for actuating the motor and 15 causing the latter to move the supporting device to operative position.

8. In a machine for decorating or marking bottles, the combination of a chuck mounted for 20 rotation, a valve, means controlled by the valve to hold a bottle in engagement with the chuck by differential, pneumatic pressure, a pneumatically operated motor controlled by said valve, and a support for the bottle actuated by said motor and movable thereby to a bottle supporting 25 position.

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