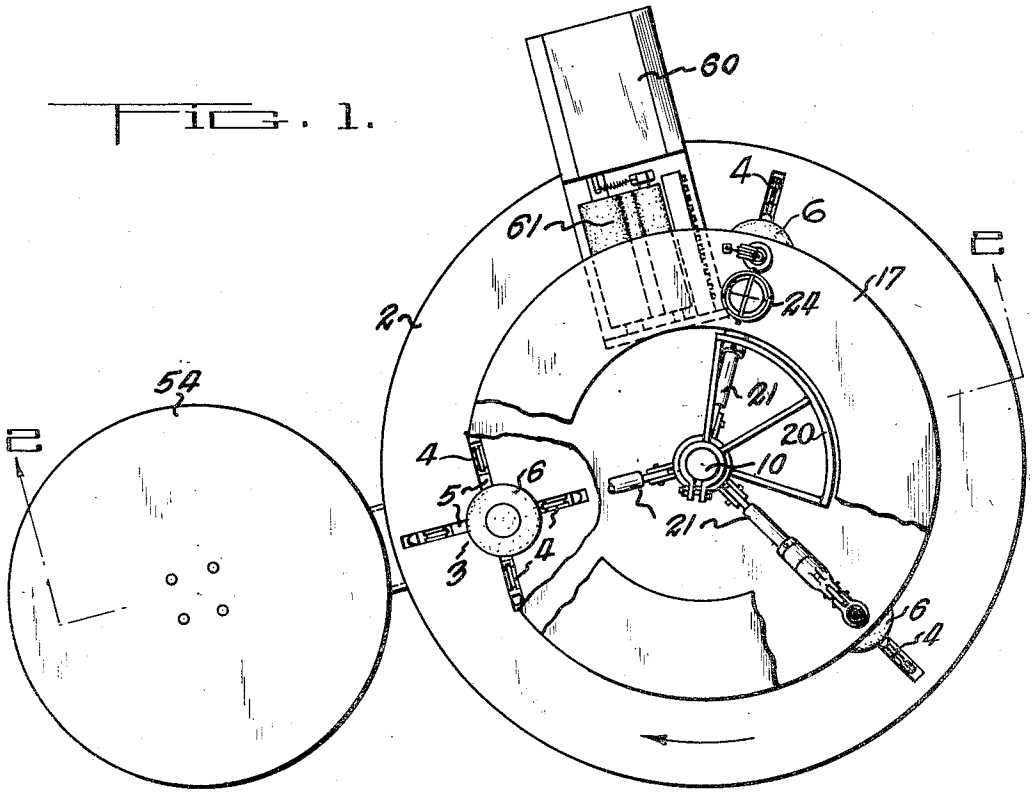
Sept. 30, 1952 G. E. RYCKMAN 2,612,106

DECORATION STAMPING MACHINE

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Fig. 1.



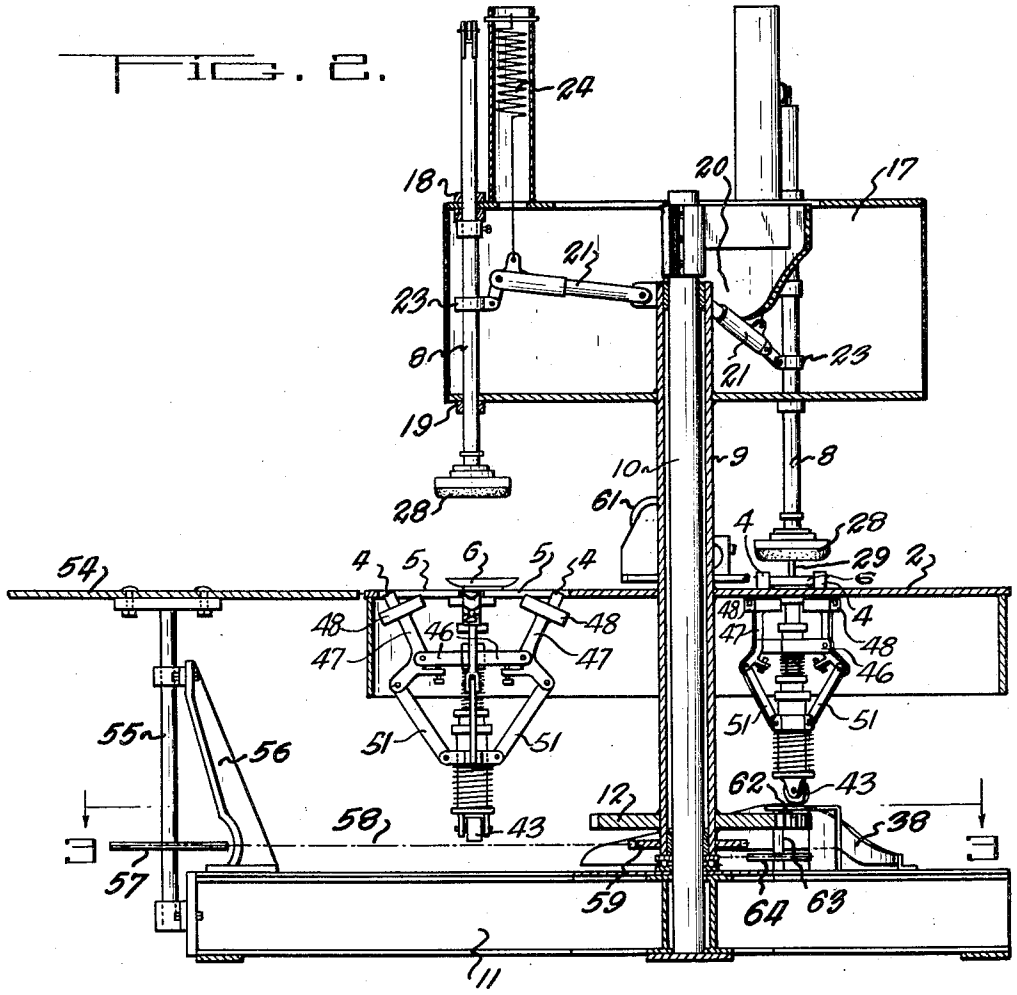
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DECORATION STAMPING MACHINE

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Fig. 2.



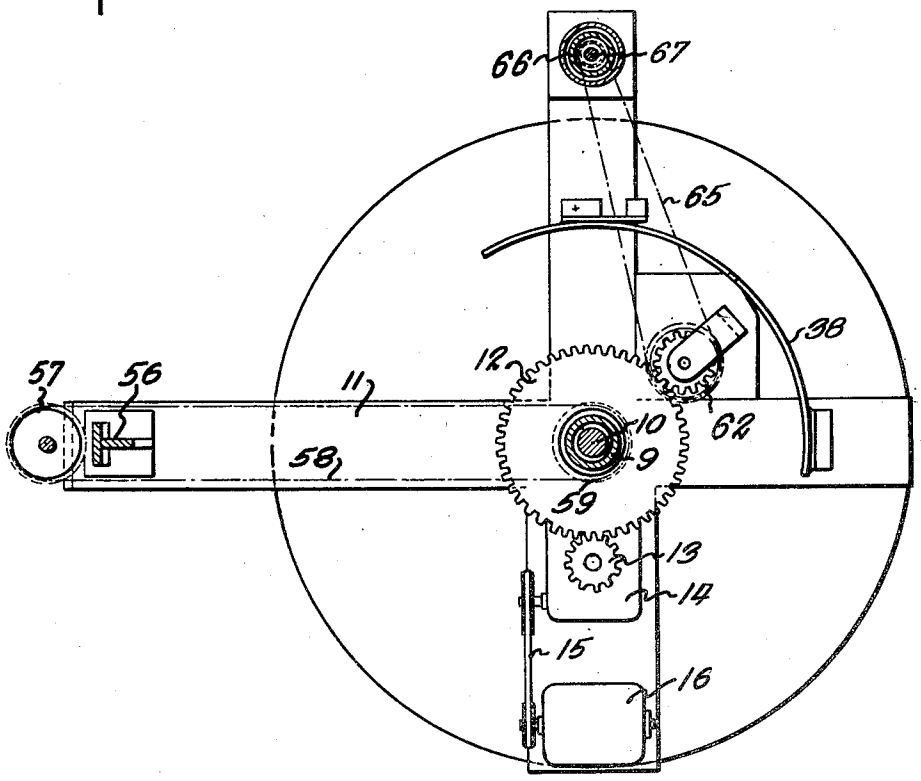
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Fig. 3.



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Fig. 4.

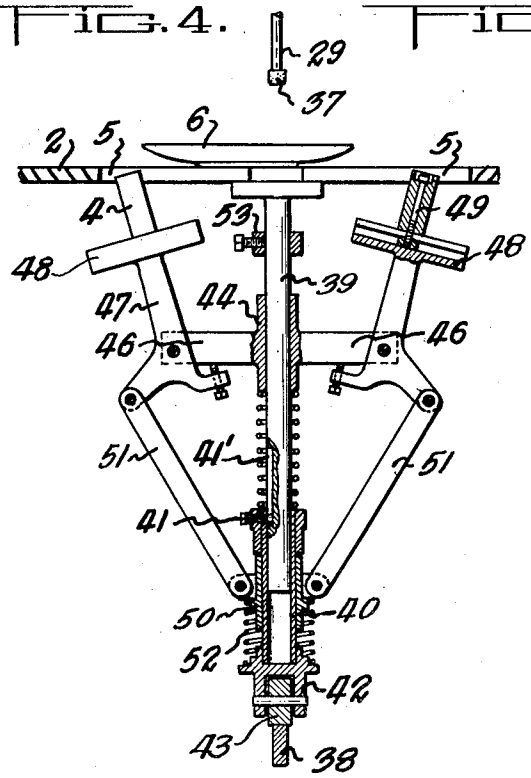
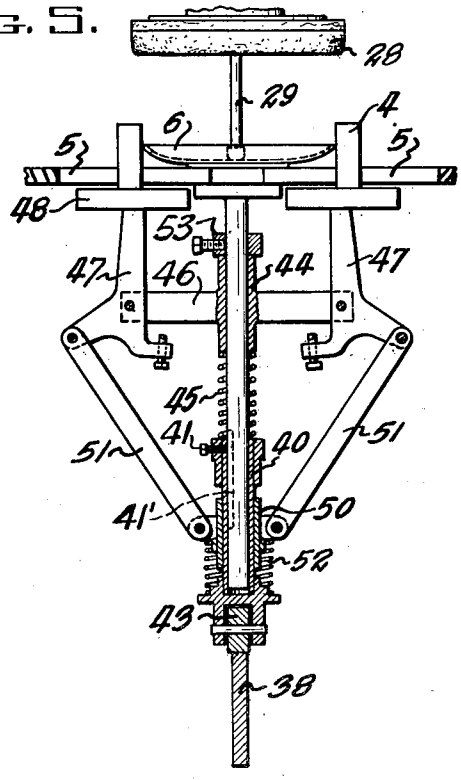


Fig. 5.



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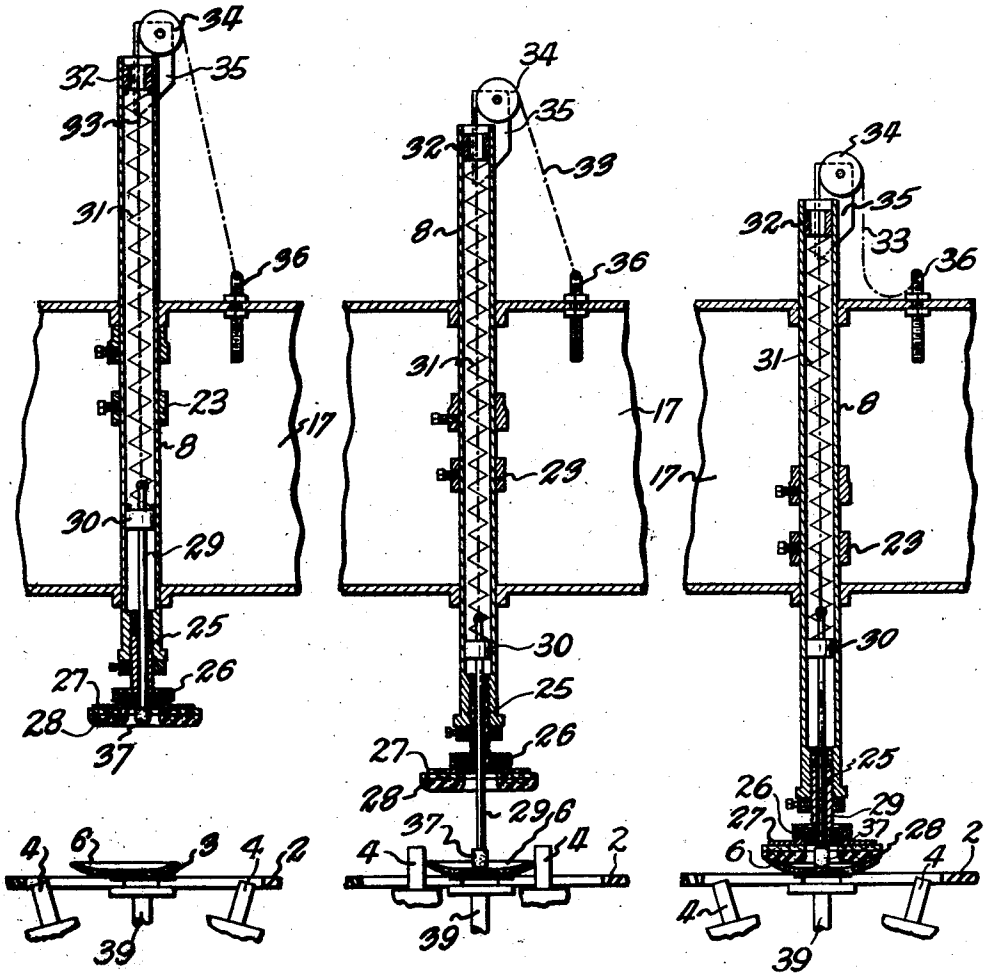
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FIG. 6. FIG. 7. FIG. 8.



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DECORATION STAMPING MACHINE

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Application June 21, 1950, Serial No. 169,356

4 Claims. (Cl. 101—407)

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The invention relates to improvements in decorating machines for chinaware, wall or floor tile, porcelain enamel work, name plates, etc. all of which shall generally be referred to herein as "ware."

The object of the invention is to devise a machine incorporating a vertical reciprocal decoration stamping die, a horizontal surface for supporting the piece of ware to be stamped and positioned within the path of the outward movement of the die whereby the die impresses upon the piece, and a reciprocal finger contained within the die and provided to contact the face of the piece of ware to hold it in position prior to the impressment of the die upon the ware face.

A further object of the invention is to provide a smooth surface upon which the piece of ware rests whereby the piece is slidable thereon, and to also furnish a plurality of dogs arranged around and normally below the ware-supporting surface and equidistantly spaced from the center thereof, a mechanism being provided to move such dogs upwardly and inwardly simultaneously towards a piece of ware resting upon the surface, whereby the dogs engage the edge of the piece and slide it into alignment with the path of travel of the die prior to impressment of the die upon the ware face.

A still further object of the invention is to furnish a mechanism for moving the dogs and wherein a compression spring is incorporated between the mechanism and the dog-carrying arms so that such spring provides a resilient snubber to prevent the dogs from exerting a breaking pressure upon the edge of the ware to be stamped; such dog actuating mechanism being synchronously coupled to a vertical reciprocal member positioned above the ware-supporting surface and upon the lower portion of which the stamping die is carried.

With the foregoing and other objects in view as shall hereinafter appear, my invention consists of a decorating machine for ware constructed and arranged all as hereinafter more particularly described and illustrated in the accompanying drawing in which Fig. 1 is a plan view of the machine, the top portions of the casings being broken away to disclose some of the mechanism; Fig. 2 is a vertical cross-sectional view taken through the line 2—2, Fig. 1; Fig. 3 is a horizontal cross-sectional view taken through the line 3—3, Fig. 2; Fig. 4 is an enlarged vertical view, partly in cross-section, of the dog mechanism wherein the dogs are in the retracted position before engaging a piece of

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chinaware resting upon the ware-supporting surface; Fig. 5 is a similar view to Fig. 1, showing the dogs in the ware-engaging position wherein the ware is centered upon its surface and engaged by the reciprocal finger extending downwardly through the stamping die which is approaching the piece of ware; Fig. 6 is an enlarged vertical cross-sectional view through the stamping die and the vertical tube upon the lower end of which the die is carried, and showing the finger slidably contained within the tube together with a spring for urging the finger downwardly, the die and tube being at the upper end of the reciprocating stroke, and the ware-engaging dogs in their retracted position; Fig. 7 is a similar view to Fig. 6, showing the tube and die descending, the dogs engaging the piece of chinaware, and the finger fully extended downwardly to engage the surface of the piece of chinaware; and Fig. 8 is a similar view to Figs. 6 and 7, showing the dogs retracted and the die impressed upon the surface of the piece of chinaware.

The machine is designed to operate upon several pieces of ware at the same time, and as illustrated, consists of a rotatable table 2 having three stations to handle three pieces of ware; each of which consists of a ware-supporting surface, a set of dogs and a reciprocal die positioned thereabove.

Each station comprises a flat portion 3 of the table surface 2 surrounded by four similar dogs 4 which move vertically and swing upwardly through four radially arranged slots 5 in the surface 2, a piece of chinaware 6, for example, being placed upon the surface 3 to be engaged by the dogs. A stamping die is positioned above each surface 3 and carried upon the lower end of a reciprocal tube 8.

The table 2 is secured to and positioned intermediately of the height of a central sleeve 9 journalled upon a stationary shaft 10 around which the machine rotates. The shaft 10 extends upwardly from a base 11. The sleeve 9 carries a gear 12 which meshes with a pinion 13 of a speed reducer 14 coupled by a driving belt 15 to an electric motor 16, as shown in Fig. 3. The upper end of the sleeve 9 carries a drum-shaped housing 17, and projects into the housing as shown in Fig. 2. The housing carries the three vertical tubes 8 which are equidistantly spaced apart and reciprocally contained within slide bearings 18 and 19 in the upper and lower faces of the housing 17.

From the foregoing description it will be understood that the sleeve 9, table 2, dog assem-

blies, housing 17 and die carrying tubes 8 rotate in unison about the stationary shaft 10 upon actuation of the driving motor 16.

To obtain the desired reciprocating movement of the tubes 8 as the machine rotates, a stationary segmental cam plate 20 is mounted upon the top of the stationary shaft 10, the lower edge of the plate being of suitable convex curvature to provide the desired reciprocation of the die carrying tubes 8.

Three radial arms 21 pivotally extend from lugs 22 upon the upper end of the sleeve 9, and are linked to collars 23 adjustably secured upon the tubes 8. The arms 21 ride against the lower curved face of the cam 20 and are each urged upwardly by a tension spring 24 contained within a vertical tube carried upon the upper face of the casing 17. It will thus be understood that as each arm contacts the lower surface of the cam 20, the arm will be moved downwardly by the cam against the resilience of its spring 24, and that the tubes 8 will have a reciprocating motion under the influence of the cam 20 and the springs 24, as the tubes and the table 2 rotate.

Referring to one of the die and tube assemblies as shown in Figs. 6 to 8, the lower open end of the tube 8 contains a sleeve 25 which is threaded thereinto and carries a ball race assembly 26 upon its lower end. A die receiving head 27 is carried by the ball race assembly 26 to be freely rotatable upon the end of the tube 8 for even application of pigment to the die, as shall hereinafter be explained. A ware stampinig ring-shaped die 28 is secured to the die head 27.

A ware-engaging finger 29 is carried loosely within each sleeve 25 and is furnished with a piston head 30 in the vicinity of its upper end to retain the finger in sliding alignment within tube 8. A spiral spring 31 is contained within the tube above the finger head 30 and is interposed between the head and a bushing 32 carried within the upper end of the tube. The spring urges the head 30 and finger 29 downwardly. A chain or line 33 extends downwardly through the bushing 32 and the tube 8 and is attached to the upper end of the finger 29. A pulley 34 is carried upon a bracket 35 upon the upper end of the tube 8, and the line 31 passes thereover to be anchored to the top of a line tension adjusting screw 36 threaded into the top face of the casing 17.

When the tube 8 and its die 28 is in the uppermost position as shown in Fig. 6, the tension effected upon the line 33 draws the finger 29 upwardly against the compression of the spring 31 so that the tip 37 of the finger 29 is retracted into the center of the die 28.

As the tube 8 commences its descent the downward movement of the line carrying pulley 34 upon the top of the tube will allow the finger 29 to descend, under the compression influence of the spring 31, at approximately twice the speed of the tube 8 and the die 28, whereby the finger 29 moves outwardly from the die 28 and contacts the piece of chinaware lightly before the die makes its impression, so as to prevent the piece from bouncing on the table. During the upward stroke of the tube 8 the die finger will be retracted at approximately twice the speed of the tube, so that when the tube reaches the upper end of this stroke the tip 37 of the finger 29 will be withdrawn to a position above the impressing face of the die 28, as shown in Fig. 6.

The base 11 of the machine carries a suitably positioned segmental cam 38 having its upper cam face of convex form. This cam is furnished to operate the dog-actuating mechanisms which depend from the lower face of the rotatable table 2 and ride thereover.

Each of the dog mechanisms, as illustrated in Figs. 4 and 5, comprises a spindle 39 which projects downwardly from the bottom of the table 2 and is concentrically arranged with the radial dog slots 5 defining the surface upon which the piece of chinaware is placed. A sleeve 40 is slidably carried upon the lower end of the spindle 39 and furnished with a key screw 41 which projects into a keyway 41' in the spindle, thus preventing the sleeve 40 from rotating upon the spindle and also limiting the sliding movement of the sleeve upon the spindle. The lower end of the sleeve 40 carries a shoe 42 containing a roller 43 that rolls upon the upper edge of the cam 38.

A dog-supporting spider 44 is slidably mounted upon the spindle 39 above the sleeve 40, and a spiral spring 45 slidably encircles the spindle 39 between the upper end of the sleeve and the spider, whereby upward movement of the sleeve 40 upon the spindle 39 pushes the spring 45 and the spider 44 upwardly.

As will be seen upon reference to Fig. 1, four dogs 4 are provided, and therefore the spider 44 contains four radial arms 46, about the ends of which the dogs swing. The normal position of the dogs is below surface 3 so that there will be nothing to interfere with sliding ware onto or off that flat surface.

Each dog assembly consists of a bell crank lever 47 pivoted upon the outer end of its radial spider arm 46 and having a T-shaped slotted head 48 to which the dog 4 is adjustably attached by means of a bolt 49 extending through the dog 4 and the slot in the T-shaped head 48. By loosening the bolt 49 the dog may be slidably adjusted along the head 48.

An outer sleeve 50 slidably surrounds the sleeve 40 upon the lower end of the spindle 39 and carries four lugs to which the lower ends of four links 51 are pivotally attached. The upper ends of the links 51 are pivotally connected to the lower ends of the bell crank dog levers 47. It will thus be appreciated that as the sleeve 50 is moved upwardly the corresponding upward movement of the links 51 will swing the levers 47 on the spider arms 46 and dogs 4 inwardly. A spiral snubber spring 52 encircles the sleeves 40 and 50 and is interposed between the top of the shoe 42 and a shoulder formed upon the sleeve 50 beneath the link attachment lugs.

When the shoe 42 is moved upwardly through the engagement of its roller 43 with the face of the cam 38, the shoe 42 will push the sleeve 40 upwardly upon the spindle 39, and as the sleeve 50 rests upon the spring 52 carried by the shoe, such sleeve 50 will also move upwardly, as will the spider 44 resting upon the top of the spring 45 which sits upon the top of the sleeve 40. The upward movement of the assembly will continue until the upper face of the spider 44 contacts a stop collar 53 secured upon the spindle 39 above the spider. When such contact is made, the upward movement of the spider 39, levers 47 and dogs 4, which now project above the table, will stop, and further upward movement of the sleeve 40 against the compression of the spring 45 will cause the links 51 to move upwardly and the levers 47 and dogs 4 to move towards the center of the chinaware supporting surface so that the dogs engage and center the piece of chinaware 6 thereon.

As the sleeve 50 carrying the links 51 floats upon the spring 52 which urges the sleeve upwardly, it will be appreciated that upon any final closing movement of the dogs 4 after the dogs engage the edge of the chinaware piece 6 the spring 52 will further compress and thus prevent the dogs from crushing the edge of the piece. As the table 2 continues its rotative movement and the roller 43 passes down the slope of the cam 38, the sleeves 40 and 50 will move downwardly under the compression of the spring 45 and the dogs 4 will swing downwardly and outwardly into the position shown in Fig. 4.

A rotatable chinaware-loading table 54 is adjacently positioned to the rotating table 2 and at the same level. The table 54 is carried upon a spindle 55 rotatably journalled within a frame 56 attached to the frame 11. The spindle 55 carries a sprocket wheel 57 which is connected by a chain 58 to a sprocket wheel 59 of the same size upon the sleeve 9, whereby the loading table 54 rotates in unison with the table 2 and at the same rate per minute.

The operation of the mechanism is quite simple. The operator takes his position adjacent to the rotating tables 54 and 2 and places a piece of chinaware upon a table surface 3 surrounded by dogs 4, while the table rotates in a clockwise direction, as shown in Fig. 1. As the table rotates, the roller 43 upon the lower end of a dog assembly rotates on to the face of the cam 38 which causes the dogs 4 to move upwardly and inwardly within the slots 5 to engage the edge of the piece of chinaware. It will be appreciated that the dogs in moving inwardly simultaneously will, if the chinaware piece is off center, slide the piece to a central position wherein each of the dogs engages the edge of the piece. Unless the ware is placed on surface 3 considerably off center, the finger 29 will merely swing in sleeve 25 as the ware is centered.

While the foregoing piece-centering and dog-gripping operation is taking place, the tube 8 thereabove is moving downwardly from the position shown in Fig. 6 to the position shown in Fig. 7, under the influence of the cam 20 bearing against its arm 21, and during which movement the finger 29 moves downwardly to engage the surface of the piece, as shown in Fig. 7. Immediately after the tip 37 of the finger 29 engages the surface of the piece, the dog mechanism passes the peak of the cam 38. As the roller 43 travels down the inclined surface of the cam the dogs 4 swing away from the edge of the piece, the piece being then held in place by the finger 29. When the dogs 4 are retracted, as shown in Fig. 8, the tube 8 travels to its lowermost position wherein the die 28 is pressed against the piece, the arm 21 of the tube 8 being at the peak of the cam 20.

As the table 2 continues its rotation, the arm 21 rides upwardly upon the inclined trailing face of the cam and the tube 8 moves upwardly into the position shown in Fig. 6 wherein the finger 29 is retracted into the tube, thus permitting the stamped piece of chinaware to be removed by the operator. Since the die rises away from the ware before finger 29 starts to rise, the finger serves as a stripper that prevents the ware from following the die in case they tend to stick together. It will thus be understood that the piece of chinaware is gripped and centered by the dogs 4, held in its adjusted position by the finger 29 and impressed by the die 28 in one revolution of the table 2. As the table illustrated contains three stations, three

pieces of ware may be stamped upon each revolution of the table 2.

In order to apply pigment to the faces of the stamps 28, I furnish a suitably arranged pigment applying device 60 which incorporates a pigment applying roller 61 radially positioned above the face of the rotating table 2, the rollers being so arranged that the faces of the dies 28 come in contact with it as they pass over it. As the die heads 27 are freely rotatably carried upon the lower end assemblies of the tubes 8, the dies rotate as they come into inking contact with the pigment roller, thus substantially eliminating drag and assuring even application of pigment. The rollers of the pigment applying device are driven from the rotating sleeve 9 by a pinion 62 carried upon a journalled spindle 63 which also carries a sprocket wheel 64 connected by a chain 65 to a sprocket 66 upon a spindle 67 leading to the driving mechanism of the pigment applying rollers 61.

From the foregoing description it will be apparent that I have devised a very simple, easily adjustable, fast and positive machine for applying decorative designs to pieces of ware and which may be readily operated by unskilled labor. Although I have shown and described a particular embodiment of my invention, it is to be understood that I may make such changes and alterations which I may deem necessary from time to time, without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. In a machine for stamping decorative designs on pieces of ware, a table having a smooth surface provided with a group of at least three slots radiating from a given center point on the table, a vertical spindle mounted below said center point, a spider slidably mounted on the spindle, upright levers pivotally mounted on the spider below said slots, dogs mounted on the upper ends of the levers at each slot, the upper ends of the dogs normally being disposed below said surface and equidistantly from said center point, a sleeve slidably mounted on the spindle below the spider, a coil spring encircling the spindle between the sleeve and spider, links connected at their opposite ends with the sleeve and the lower ends of said levers, means for raising the sleeve on the spindle to push the coil spring and spider upward thereon and thereby raise the dogs through said slots, and a stop on the spindle for limiting upward movement of the spider while the sleeve continues to rise and compresses the spring, whereby said links will swing the dogs inward to enable them to engage the edge of a piece of ware resting upon said surface and slide it into a central position thereon.

2. In a machine for stamping decorative designs on pieces of ware, a table having a smooth surface provided with a group of at least three slots radiating from a given center point on the table, a vertical spindle mounted below said center point, a spider slidably mounted on the spindle, upright levers pivotally mounted on the spider below said slots, dogs mounted on the upper ends of the levers at each slot, the upper ends of the dogs normally being disposed below said surface and equidistantly from said center point, a sleeve slidably mounted on the spindle below the spider, a coil spring encircling the spindle between the sleeve and spider, a shoe mounted on the lower end of the sleeve, a second sleeve slidably mounted on the first-mentioned sleeve, a second coil spring encircling the first sleeve and normally spacing

the second sleeve from said shoe, links pivotally connected at their opposite ends with the second sleeve and the lower ends of said levers, means for periodically raising the shoe to push the sleeves and springs and spider upward on the spindle and thereby raise the dogs through said slots, and a stop on the spindle for limiting upward movement of the spider while the sleeves continue to rise and compress the first spring, whereby said links will swing the dogs inward to enable them to engage the edge of a piece of ware resting upon said surface and slide it into a central position thereon.

3. A stamping machine for decorating pieces of ware supported on a horizontal surface, wherein the surface upon which the ware rests is smooth so that a piece of ware is slidable thereon, a plurality of dogs arranged around the ware supporting surface and equidistantly spaced from the center thereof, means for moving said dogs inwardly simultaneously towards a piece of ware resting upon the surface to engage the edge of the piece and slide it into a central position upon the surface, a vertical spindle positioned beneath the piece of ware supporting surface, a spider slidably mounted upon the spindle intermediately of its height, bell crank levers pivotally mounted upon the outer ends of the spider arms, the dogs being carried upon the upper ends of said bell crank levers and projecting through slots in the ware piece supporting surface, a slidable sleeve carried upon the spindle below the spider, a spiral spring slidably encircling the spindle and interposed between the sleeve and the spider, links extending from the sleeve to the lower ends of the bell crank levers, a stop for limiting the upward movement of the spider, and means for raising the sleeve, spring, spider, bell crank levers and dogs upwardly to the limit governed by the stop and for swinging the bell crank levers and dogs within the slots to engage the edge of a piece of ware slidably resting upon the supporting surface.

4. A stamping machine for decorating pieces of ware supported on a horizontal surface, wherein the surface upon which the ware rests is smooth so that a piece of ware is slidable thereon, a plurality of dogs arranged around the ware supporting surface and equidistantly spaced from the center thereof, means for moving said dogs inwardly simultaneously towards a piece of ware

resting upon the surface to engage the edge of the piece and slide it into a central position upon the surface, a vertical spindle positioned beneath the piece of ware supporting surface, a spider slidably mounted upon the spindle intermediately of its height, bell crank levers pivotally mounted upon the outer ends of the spider arms, the dogs being carried upon the upper ends of said bell crank levers and projecting through slots in the ware piece supporting surface, a slidable sleeve carried upon the spindle below the spider, a spiral spring slidably encircling the spindle and interposed between the sleeve and the spider, links extending from the sleeve to the lower ends of the bell crank levers, a stop for limiting the upward movement of the spider, a second sleeve carried by the spindle and encircled by the first sleeve, a shoe carried upon the bottom of the second sleeve, a snubber compression spring encircling the second sleeve and interposed between the shoe and the bottom portion of the first sleeve, and means for raising the sleeve, both springs, spider, bell crank levers and dogs upwardly to the limit governed by the stop and for swinging the bell crank levers and dogs within the slots to engage the edge of a piece of ware slidably resting upon the supporting surface.

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