

Oct. 18, 1949.

R. F. MALARKEY

2,485,159

MACHINE FOR JIGGERING OVAL DINNERWARE

Filed Sept. 25, 1948

4 Sheets-Sheet 1

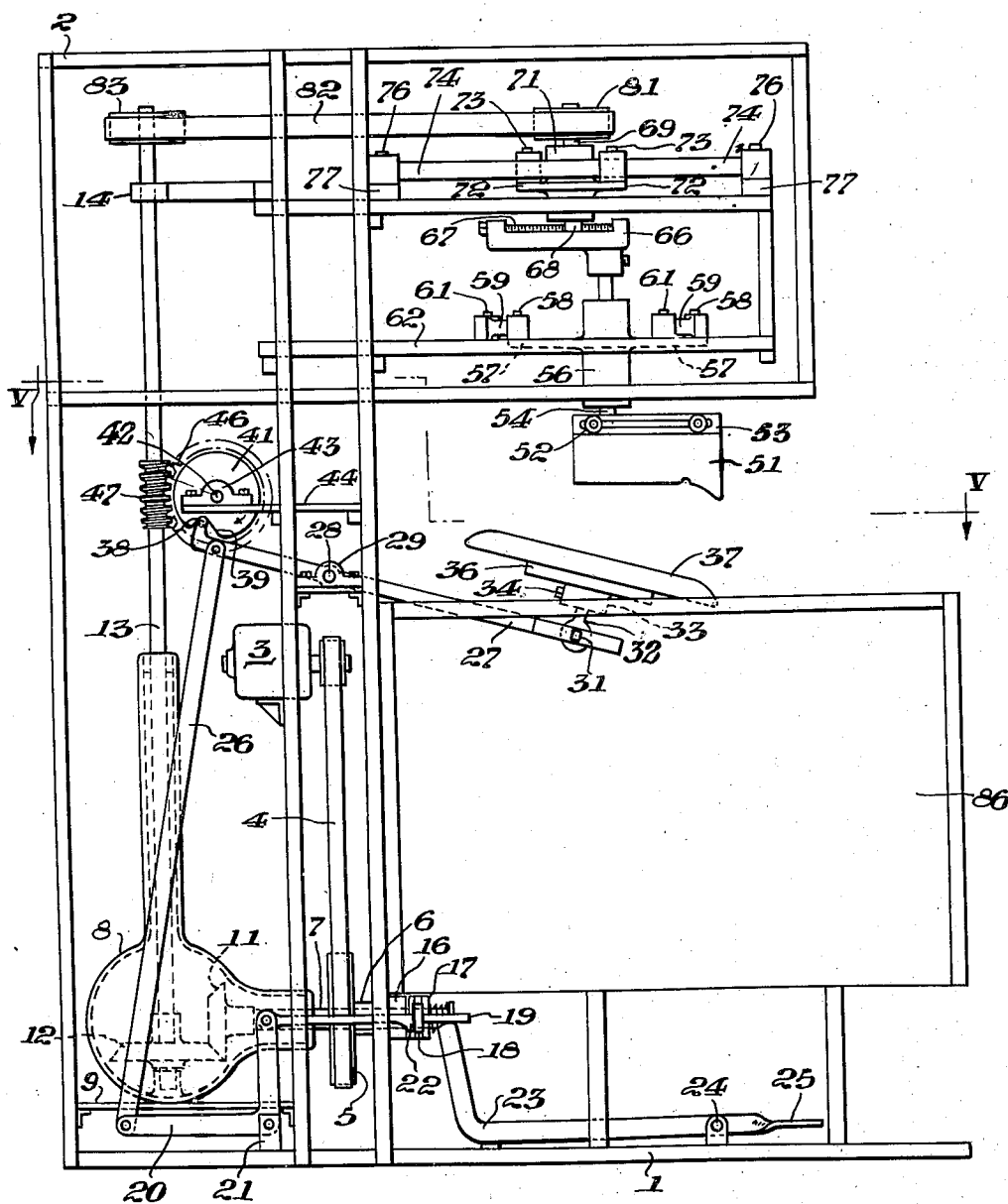


Fig. 1.

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4 Sheets-Sheet 2

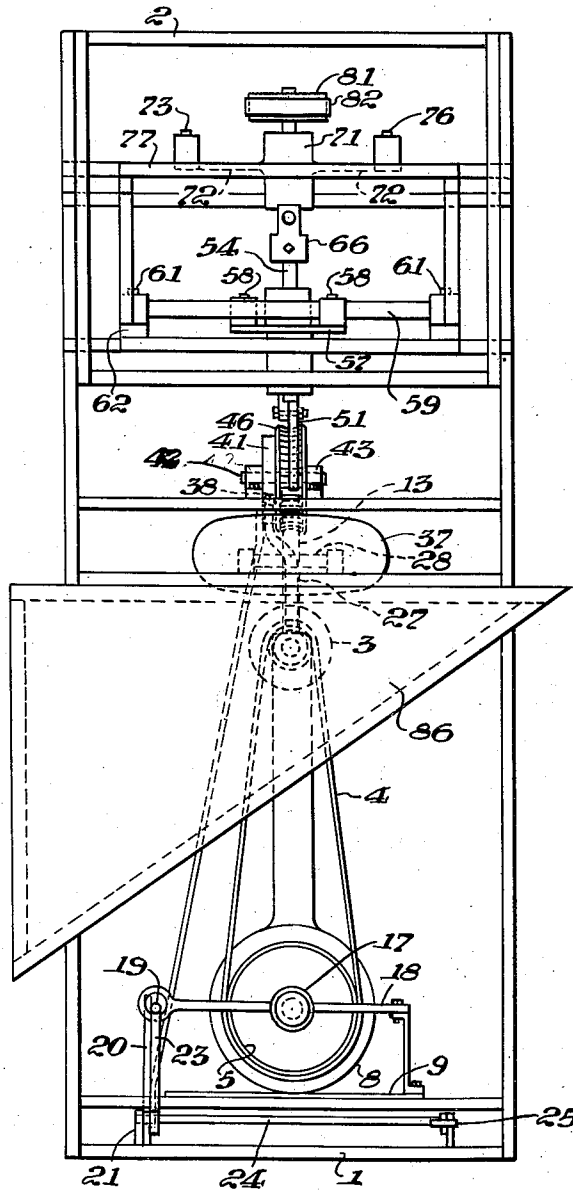


Fig. 2.

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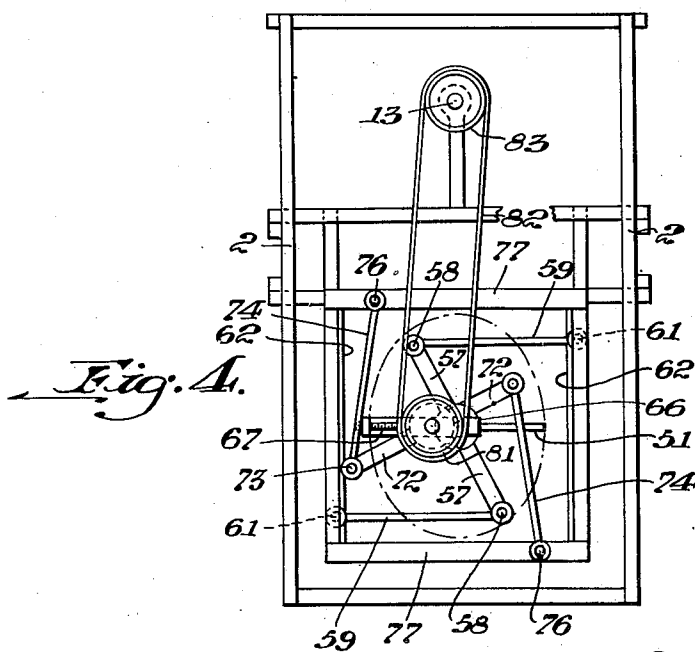
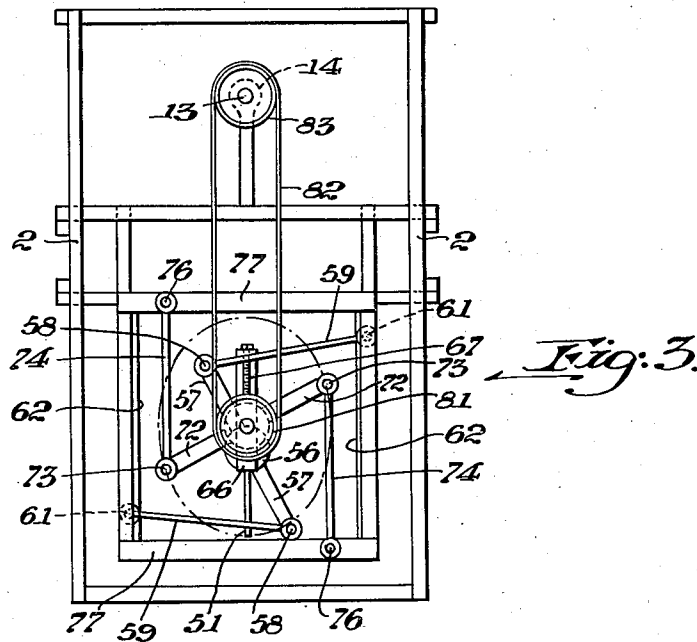
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4 Sheets-Sheet 4

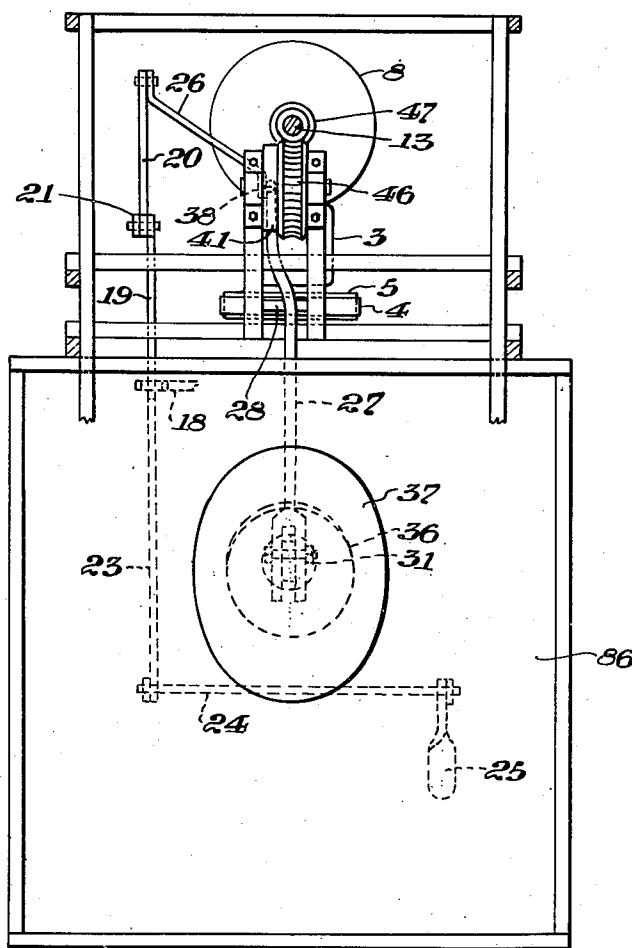


Fig. 5.

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UNITED STATES PATENT OFFICE

2,485,159

MACHINE FOR JIGGERING OVAL
DINNERWARE

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Application September 25, 1948, Serial No. 51,275

14 Claims. (Cl. 25—25)

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This invention relates to apparatus for moving a tool in an elliptical path, and more particularly to apparatus for jiggering oval dinnerware and the like.

It is among the objects of this invention to provide such apparatus which is easily adjustable for dinnerware and the like of different sizes and of different lengths relative to their widths, which is of relatively simple and inexpensive construction, which is easy to operate and which is automatic.

In accordance with this invention a lower vertical shaft has its lower end connected to a tool, such as a jigger tool, which is to be moved in an elliptical path. In making oval dinnerware, such as platters, the tool should move in a path that will jigger plastic clay on an oval mold supported below the tool. The shaft just mentioned is mounted in a bearing which is supported for reciprocation in a substantially straight line along the major axis of the elliptical path. Although the bearing support may be a straight track, it is preferred to use horizontal links pivotally connected on vertical axes to lateral projections of the bearing at diametrically opposite points. The links extend tangentially of the bearing away from it in opposite directions, and their outer ends are pivotally connected on vertical axes to a supporting frame. An upper vertical shaft has its lower end offset laterally of the upper end of the lower shaft, and the adjacent ends of the two shafts are rigidly, but preferably adjustably, connected together so that, in effect, a crank is formed. The upper shaft is mounted in a bearing which is supported for reciprocation in a substantially straight line along the minor axis of the elliptical path. The supporting means for this bearing preferably includes another pair of horizontal links extending substantially at right angles to the first pair. Means is provided for rotating one of the two connected shafts, most suitably the upper shaft which in turn rotates the lower shaft. Due to the mounting of the two bearings, the crank-like connection of the two shafts causes the bearings to reciprocate in horizontal straight lines at right angles to each other. The result is that the tool carried by the lower shaft is moved in an elliptical path. The support for the mold preferably is such that it periodically moves the mold up toward the tool and then down again. A continuously operating driving means may be used which is connected to the rest of the apparatus through a manually operable clutch. When the clutch is

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engaged the mold moves upward and the tool travels around the mold. When the mold is lowered after the jiggering operation has been completed, it automatically disengages the clutch so that the machine stops until the clutch is manually engaged again. The movements of the mold support most suitably are controlled by a rotating cam.

Various parts of this apparatus are described as being vertical or horizontal. This is merely to set forth the positions of the parts relative to one another for ease of description, and is not intended to limit the invention.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which Fig. 1 is a side view of the jiggering machine; Fig. 2 is a front view; Fig. 3 is a reduced plan view; Fig. 4 is a view like Fig. 3, except that the jigger tool is shown at right angles to its former positions; and Fig. 5 is a horizontal section taken on the line V—V of Fig. 1.

Referring to the drawings, a base plate 1 supports on its rear end portion a frame 2 that extends upward and then forward over the base. Mounted in the upright portion of the frame is an electric motor 3 which is connected by a belt 4 to a pulley 5 rotatably mounted on a horizontal shaft 7 below it. The shaft is journaled in a gear housing 8 mounted on a support 9 near the bottom of the frame. The inner end of the shaft carries a bevel gear 11 that meshes with a similar gear 12 on the lower end of a vertical drive shaft 13 that extends up out of the housing and has its upper end journaled in a bearing 14 in the upper part of the frame. Projecting from the front side of pulley 5 is a sleeve 6 through which shaft 7 extends. The outer or front end of the sleeve and the corresponding end of shaft 7 support the two parts 16 and 17, respectively, of a normally disengaged clutch so that the pulley and sleeve can rotate without turning the shaft. The clutch is a conventional clutch, the details of which form no part of this invention. Part 16 is rigidly fastened to sleeve 5, but part 17 is splined on shaft 7 and is spring pressed toward part 16. Clutch part 17 normally is held forward away from the other part by means of a lever 18 that encircles part 17 and has a free end extending away from it. It can be engaged by lifting a lever 18 projecting from one side of it. The outer end of this lever encircles the front end of a rod 19 that is pivotally connected to the upper end of a bent lever 20 supported by a bracket 21 mounted on the base plate. Rod 19 is provided with a lug 22 that engages lever 18

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and holds it in its forward position. The front end of rod 19 rests on the upper rear end of an L-shaped arm 23 whose front end is secured to one end of a horizontal shaft 24 rotatably mounted on the base. The opposite end of this shaft carries a forwardly projecting foot pedal 25 which, when depressed, raises the rear end of the arm to lift rod 19 until lever 18 can slide back over lug 22 to permit the clutch to become engaged.

The rear end of lever 20 is pivotally connected to the lower end of a link 26 whose upper end is pivotally connected to the rear end of an arm 27. The central portion of this arm is mounted on a shaft 28 journaled in bearings 29 mounted in frame 2 above the motor. The arm normally is inclined forward and downward and extends out beneath the projecting upper portion of the frame. The front end of this arm is forked and has a bolt 31 extending transversely through it and through an upright pin 32 disposed in the fork. Mounted on the upper end of the pin is a collar 33 which is held in place by a setscrew 34 so that the collar can be turned or raised and lowered on the pin as desired. Rigidly mounted on the collar is a supporting member 36 for an oval or elliptical plaster mold 37 on which plastic clay can be jiggered to form a platter or the like. It is most convenient to have the major axis of the mold extend from front to back of the machine.

The rear end of the inclined arm is provided with an upward extension that has a cam follower roller 38 on its upper end. This roller extends up into a deep notch 39 in a cam 41 that is secured to a shaft 42 journaled in bearings 43 mounted on the rear ends of horizontal supporting members 44 fastened to the frame. Shaft 42 is turned by a gear 46 mounted thereon and meshing with a worm 47 mounted on vertical drive shaft 13. The shape of the cam is such that when it is rotated it forces the roller downward until arm 27 is substantially horizontal, and then holds in that position until the cam completes a revolution to return the notch to the position where the roller is moved up into it by the weight on the opposite end of the arm. Downward movement of link 26 causes lever 20 to pull lug 22 back through the eye in lever 18. Upward movement of the rear end of arm 27 causes link 26 to lift the rear end of lever 20 and thereby move rod 19 forward to cause lug 22 to push lever 18 ahead for disengaging the clutch so that the drive shaft will stop turning. The cam preferably is so shaped that it quickly moves the mold almost to its uppermost position, and after a suitable dwell it raises the mold slightly higher for a moment, and then allows it to fall away a few thousandths of an inch before lowering it.

While the mold 37 is held in horizontal position by arm 27, a batt of plastic clay thereon is jiggered by means of a profile tool 51 directly above it. This tool is adjustably connected by bolts 52 to a slotted arm 53 projecting laterally from the lower end of a short vertical shaft 54 journaled in a bearing 56. The center portion of the bearing has a pair of arms 57 projecting horizontally from it in opposite directions with their outer ends pivotally connected by vertical pins 58 to the inner ends of a pair of horizontal links 59. These links extend in opposite directions from the sides of the arms and have their outer ends pivotally connected by vertical pins 61 to a pair of parallel horizontal side members 62 mounted in the forward upper portion of the frame. When the cen-

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ter of shaft 54 is over the center of the mold, as shown in Fig. 4, these two links extend parallel to each other with their inner ends preferably passing each other. Bearing 56 is supported by these links so that it can be swung back and forth lengthwise of the mold in a substantially straight line for a considerable distance, but it is prevented by the links from moving transversely of the machine.

The upper end of shaft 54 is rigidly connected to one end of a crank arm 66 that is provided with a rotatable horizontal adjusting screw 67 along which a nut 68 travels when the screw is turned. The nut is rigidly mounted on the lower end of an upper vertical shaft 69 that is journaled in an upper bearing 71. Like the lower bearing, this one is provided with diametrically opposite arms 72 which are pivotally connected by vertical pins 73 to the inner ends of a pair of horizontal links 74. These arms are disposed at substantially right angles to arms 57 of the lower bearing, and the upper links likewise are substantially at right angles to the lower links. Therefore, the outer ends of the upper links are pivotally connected by vertical pins 76 to front and rear cross members 77 supported in the frame above side members 62. Consequently, the upper bearing, which is supported by the upper links, can swing cross ways of the machine in a substantially straight line but can not move in any other direction. It will be seen that the two bearings 56 and 71 can reciprocate in horizontal straight lines at right angles to each other. Mounted on the upper end of upper shaft 69 is a pulley 81 that is driven by a belt 82 and a pulley 83 from the upper end of vertical drive shaft 13. The belt has enough elasticity to permit the front pulley to move transversely of the machine in a straight line.

The upper and lower shafts 69 and 54 and the connecting arm 66 serve as a crank which is rotated by upper belt 82. As the lower shaft is rotated by the upper one, it rotates the jigger tool, but it simultaneously carries the tool in an elliptical path because the crank arm 66 reciprocates the lower shaft lengthwise of the mold due to the facts that upper links 74 keep the upper shaft from moving in that direction and that movement of the lower shaft transversely of the mold is prevented by the lower links 59. As the crank arm prevents the two shafts from rotating on the same axis and as the lower shaft can only move forward and backward, it follows that the crank arm reciprocates the upper shaft transversely of the mold at the same time that the lower shaft moves lengthwise of it.

To jigger a larger oval of the same shape, tool 51 is merely adjusted outward on arm 53. If it is desired to lengthen the major axis of the elliptical path without changing its minor axis, adjusting screw 67 is turned to move lower shaft 54 farther away from the upper shaft, thereby increasing the distance that the tool is moved forward and backward without affecting the length of its reciprocation crossways.

In operation, a mold with a batt of clay on it is placed on supporting member 36 which is formed for holding the mold in a predetermined position. Foot pedal 25 then is depressed to cause the motor to be operatively connected to drive shaft 13. Rotation of the drive shaft causes cam 41 to depress inclined arm 27 and thereby raise the mold to horizontal position below the jiggered tool. Simultaneously, the drive shaft rotates the crank that supports and drives the tool. The clay on the mold therefore is jiggered until the cam notch 39 allows

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the mold to descend. Water can be sprayed on the clay during jiggering. As the mold descends, the rising rear end of arm 27 causes the motor to be disconnected from the drive shaft, so that the jigger tool stops. The mold with the jigger oval ware on it is removed from the machine and another mold with a batt on it is placed on supporting member 36. The foot pedal is depressed again to repeat the cycle. Scrap from the jigger clay falls into a large chute 86 from which it can slide into a suitable collection receptacle.

If at any time it is desired to jigger circular ware with this machine, screw 67 can be turned to move lower shaft 54 inward into axial alignment with upper shaft 69. The two shafts then will rotate on the same vertical axis and neither one will be able to move laterally.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft about the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating one of said shafts so that as the lower shaft rotates it will simultaneously be reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path.

2. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, an adjustable connection rigidly connecting said adjacent ends of the two shafts but allowing them to be adjusted laterally relative to each other, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating one of said shafts so that as the lower shaft rotates it will simultaneously be reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path.

3. A machine for jiggering oval dinnerware comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed ad-

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jacent one side of the upper end of the lower shaft, a crank arm projecting laterally from one of said adjacent ends of the two shafts and rigidly connected to the other shaft, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating the upper shaft so that the lower shaft will be rotated by it and simultaneously reciprocated by said crank arm along said first-mentioned straight line to carry said tool in an elliptical path.

4. A machine for jiggering oval dinnerware comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a crank arm projecting laterally from one of said adjacent ends of the two shafts, means rigidly connected to the other shaft and adjustable along the crank arm, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating the upper shaft so that the lower shaft will be rotated by it and simultaneously reciprocated by said crank arm along said first-mentioned straight line to carry said tool in an elliptical path.

5. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, a pulley rigidly mounted on the upper end of the upper shaft, a vertical drive shaft, a pulley rigidly mounted on the drive shaft, and a belt connecting said pulleys for driving said upper shaft.

6. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, means for rotating one of said shafts so that as the lower shaft rotates it will simultaneously be reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path, and means for periodically raising said mold support to a position adjacent the jigger tool.

7. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower

vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, a pulley rigidly mounted on the upper end of the upper shaft, a vertical drive shaft, a pulley rigidly mounted on the drive shaft, a belt connecting said pulleys for driving said upper shaft, and a cam driven from said drive shaft for periodically raising said mold support to a position adjacent the jigger tool.

18. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, a pulley rigidly mounted on the upper end of the upper shaft, a vertical drive shaft, a pulley rigidly mounted on the drive shaft, a belt connecting said pulleys for driving said upper shaft, continuously operating driving means, a manually operable clutch for operatively connecting said driving means with said drive shaft, a cam driven from said drive shaft for raising and lowering said mold support, and means operable when the mold support is lowered for disengaging said clutch.

19. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a normally inclined rocker arm pivotally supported between its ends on a horizontal axis with its lower end supporting the mold support, means for periodically moving the opposite end of the arm down to lift the mold support to horizontal position, a lower vertical shaft above the central portion of the mold support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating one of said shafts so that as the lower shaft rotates it will simultaneously be reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path.

10. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a normally inclined rocker arm pivotally supported between its ends on a horizontal axis with its lower end supporting the mold support, a rotatable cam for periodically moving the opposite end of the

arm down to lift the mold support to operative position, means for rotating the cam, a lower vertical shaft above the central portion of said mold support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, and means for rotating one of said shafts so that as the lower shaft rotates it will simultaneously be reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path.

11. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a normally inclined rocker arm pivotally supported between its ends on a horizontal axis with its lower end supporting the mold support, a rotatable cam for periodically moving the opposite end of the arm down to lift the mold support to operative position, a lower vertical shaft above the central portion of said mold support, a bearing for the shaft, means supporting the bearing for reciprocation in a substantially straight line lengthwise of the mold, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft, means supporting the last-mentioned bearing for reciprocation in a substantially straight line at right angles to said first-mentioned line, means for rotating the upper shaft so that the lower shaft will be rotated by it and simultaneously reciprocated by said connecting member along said first-mentioned straight line to carry said tool in an elliptical path, a vertical drive shaft, gears operatively connecting the drive shaft with the cam, continuously operating driving means, a manually operable clutch for operatively connecting said driving means with said drive shaft, and means actuated by said arm when it tilts back to inclined position for releasing said clutch, whereby said drive shaft will stop rotating.

12. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft having lateral projections, a pair of horizontal links pivotally connected on vertical axes to said projections on opposite sides of the shaft and extending tangentially of the bearing away from it in opposite directions, means pivotally supporting the outer ends of the links, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a connecting member rigidly connecting said adjacent ends of the two shafts, a bearing for the upper shaft having lateral projections, a pair of horizontal links pivotally connected on vertical axes to said last-mentioned projections and extending tangentially of the second bearing away from it in opposite directions at substantially right angles to said first-mentioned links, means pivotally supporting the outer ends of the second pair of links, and means for rotating one of said shafts

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so that as the lower shaft and jigger tool are rotated they will simultaneously be carried in an elliptical path.

13. A machine for jiggering oval dinnerware, comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft having a pair of arms projecting laterally from it in opposite directions, horizontal links pivotally connected on vertical axes to the outer ends of the arms and extending laterally in opposite directions away from the sides of the arms, means pivotally supporting the outer ends of the links, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a crank arm extending laterally from one of said adjacent ends of the two shafts and being rigidly connected to the other shaft, a bearing for the upper shaft having a pair of arms projecting laterally from it in opposite directions at substantially right angles to said first-mentioned arms, horizontal links pivotally connected on vertical axes to the outer ends of the last-mentioned arms and extending laterally in opposite directions away from the sides of those arms, means pivotally supporting the outer ends of the last-mentioned links, and means for rotating the upper shaft so that the lower shaft and jigger tool will be rotated and simultaneously carried in an elliptical path.

14. A machine for jiggering oval dinnerware,

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comprising a support for an oval mold, a lower vertical shaft above the central portion of said support, a bearing for the shaft having a pair of arms projecting laterally from it in opposite directions, horizontal links pivotally connected on vertical axes to the outer ends of the arms and extending laterally in opposite directions away from the sides of the arms, means pivotally supporting the outer ends of the links, a jigger tool mounted on the lower end of the shaft, an upper vertical shaft having its lower end disposed adjacent one side of the upper end of the lower shaft, a crank arm extending laterally from one of said adjacent ends of the two shafts, means rigidly connected to the other shaft and adjustable along the crank arm, a bearing for the upper shaft having a pair of arms projecting laterally from it in opposite directions at substantially right angles to said first-mentioned arms, horizontal links pivotally connected on vertical axes to the outer ends of the last-mentioned arms and extending laterally in opposite directions away from the sides of those arms, means pivotally supporting the outer ends of the last-mentioned links, and means for rotating the upper shaft so that the lower shaft and jigger tool will be rotated and simultaneously carried in an elliptical path.

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No references cited.