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Dahlman et al.

[11] **3,887,351**

[45] **June 3, 1975**

[54] **COMBINED TURRET POSITIONER AND CLAMP ASSEMBLY FOR GLASS PRESSING MACHINE**

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[73] Assignee: **Corning Glass Works,** Corning, N.Y.

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[21] Appl. No.: **492,510**

[52] **U.S. Cl.** **65/305;** 65/308; 65/321; 65/323; 65/357; 65/359; 65/361; 198/209

[51] **Int. Cl.** **C03b 11/00**

[58] **Field of Search** 65/323, 361, 305, 308, 65/359, 357, 321, 319; 198/209

[56] **References Cited**

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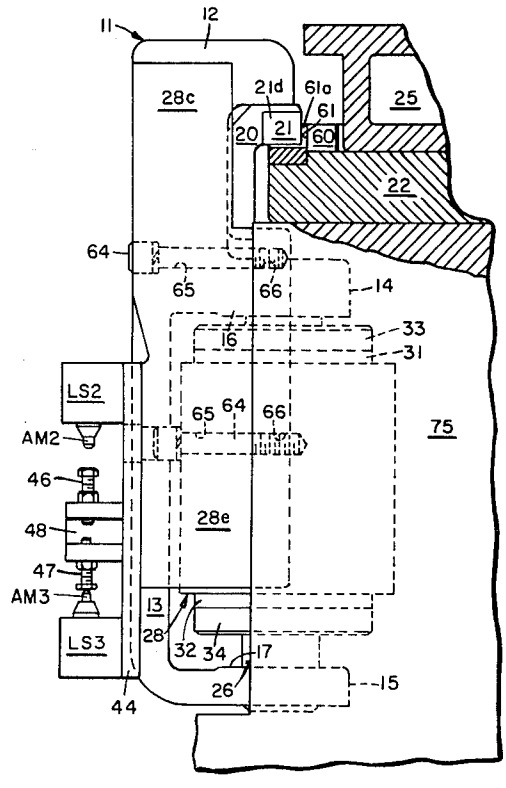
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Assistant Examiner—Frank W. Miga
Attorney, Agent, or Firm—Charles W. Gregg; Clarence R. Patty, Jr.

[57] **ABSTRACT**

A combined turret positioner and hold-down clamp assembly at a glass pressing position of a turret-type glass pressing machine and including cooperatively mating male and female members associated with mold adaptors or supports, equally spaced apart about a peripheral portion of the machine turret, and also associated with an anvil at the glass pressing position, the mating members each embodying a vertical cross-sectional configuration of an inverted truncated isoceles triangle and there being one such member associated with each mold adaptor or support and its associated mold with one of the members being similarly precisely positioned on the turret in relation to each of the respectively associated mold adaptors and molds carried thereby. Motor means at the pressing position for successively actuating the mating member at that position into mating relationship with each successive mating one of the members as each respective mold adaptor and mold is successively moved to the pressing position, and means selectively energizing the motor means to start each mating actuation as the leading edge of each respective mating member associated with each respective mold adaptor and mold is moved into vertical alignment with the corresponding edge of the mating member at the pressing position, the mating actuation continuing until the turret is actuated into firm contact with the anvil at the pressing position. In a preferred embodiment of the invention the male and female mating members each embody a vertical crosssectional configuration of an inverted truncated right triangle with the right angle of each configuration being the truncated apex angle of such configuration.

4 Claims, 9 Drawing Figures



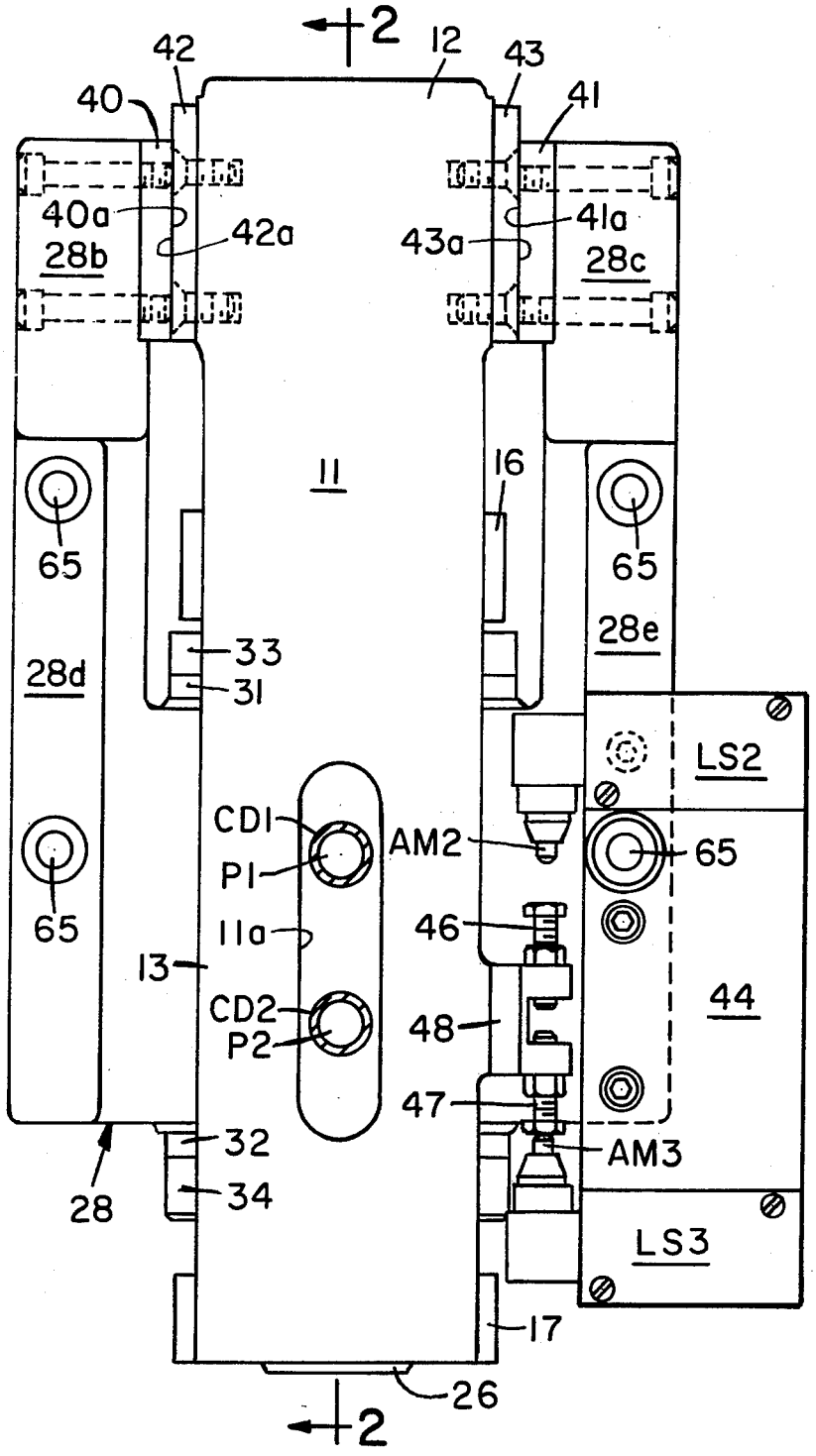

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42
12
43
40
41
40a
42a
43a
41a
28b
28c
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16
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28e
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33
31
LS2
CD1
AM2
65
P1
46
11a
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44
CD2
48
P2
47
AM3
32
34
28
LS3
17
26
2

Fig. 1

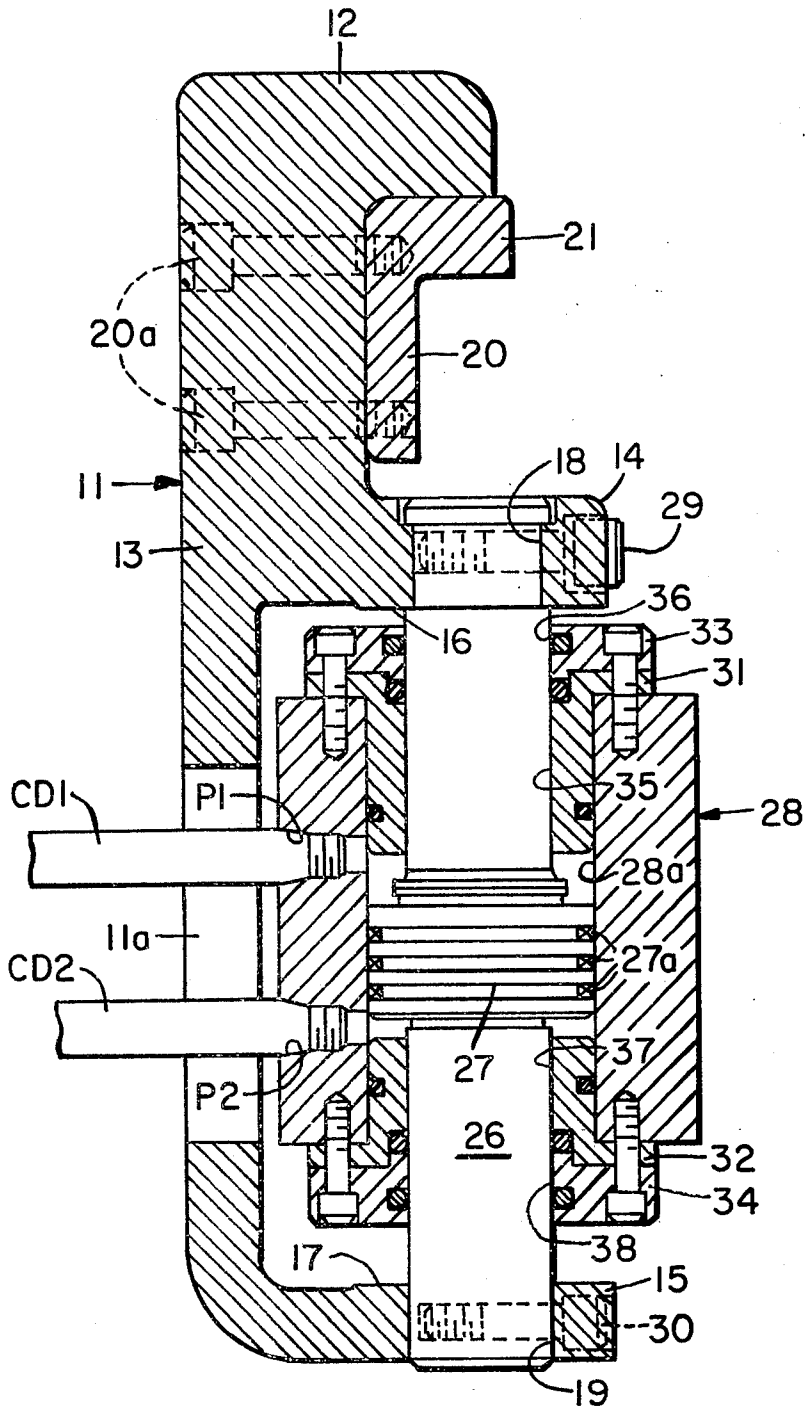

12
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20a
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16
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CD1
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CD2
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P2
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19

Fig. 2

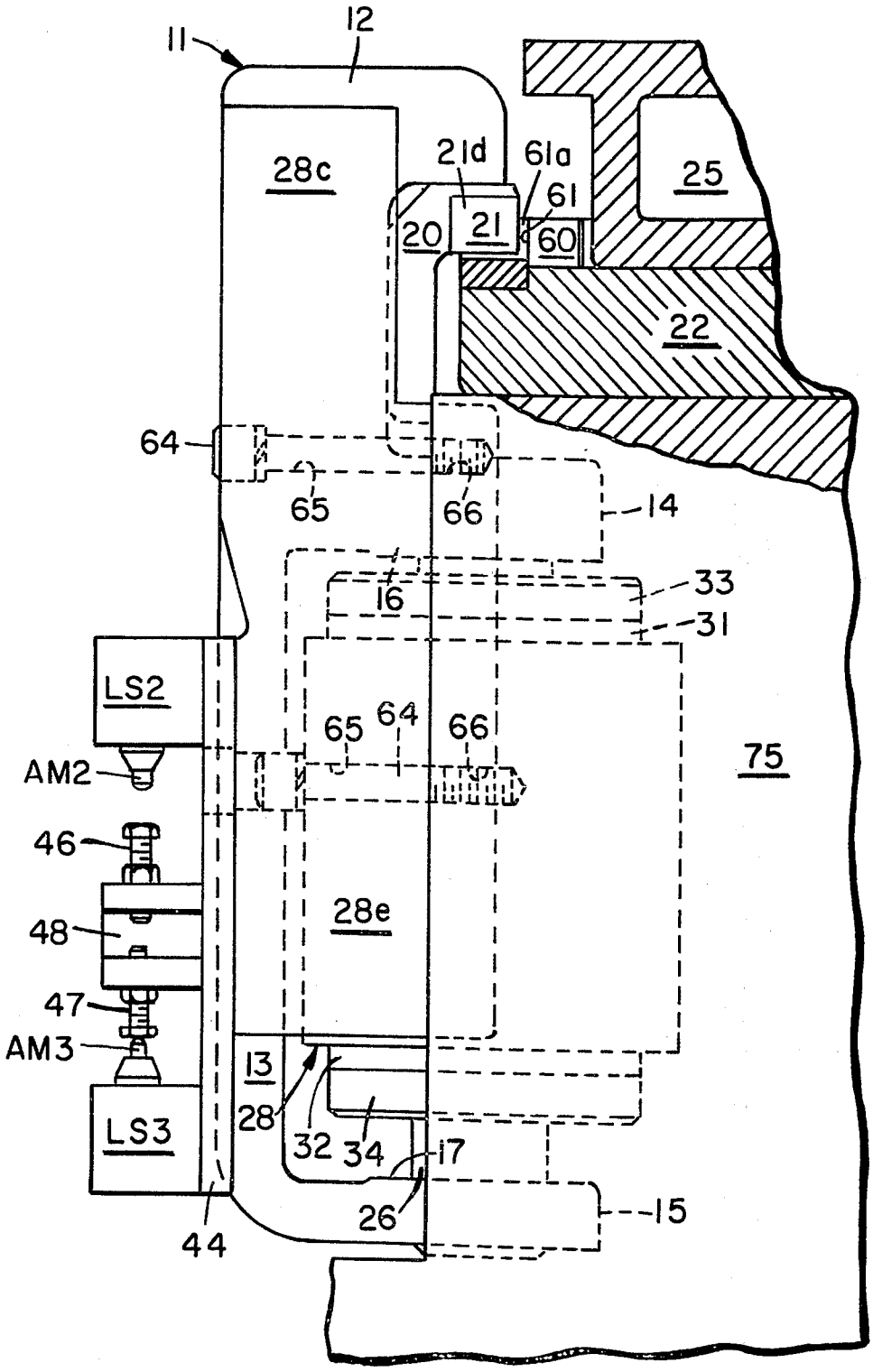

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21d
61a
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25
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64
66
75
AM2
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28e
48
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AM3
13
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32
34
17
LS3
26
15
44

Fig. 3

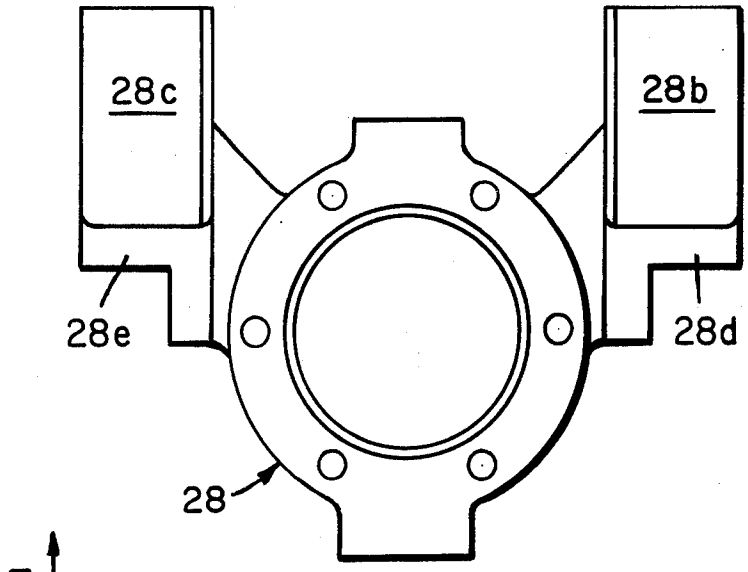


Fig. 4

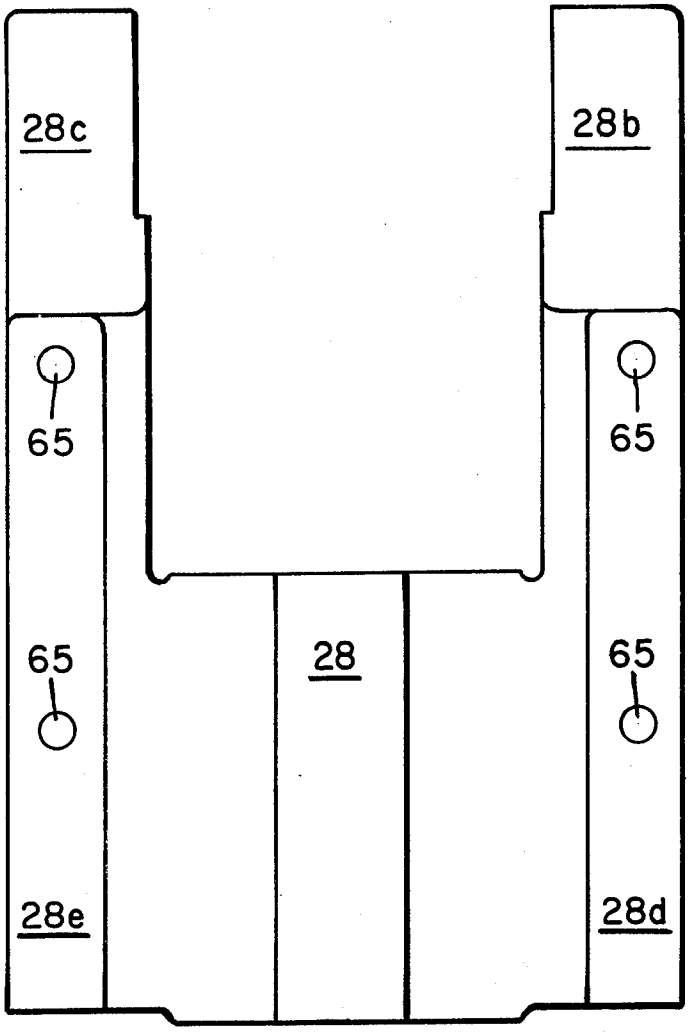


Fig. 5

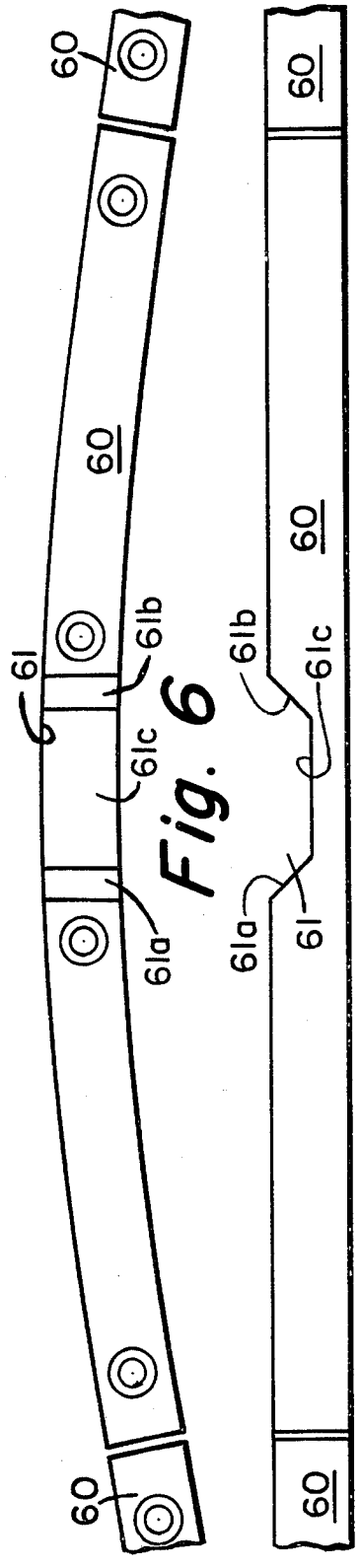


Fig. 6

Fig. 7

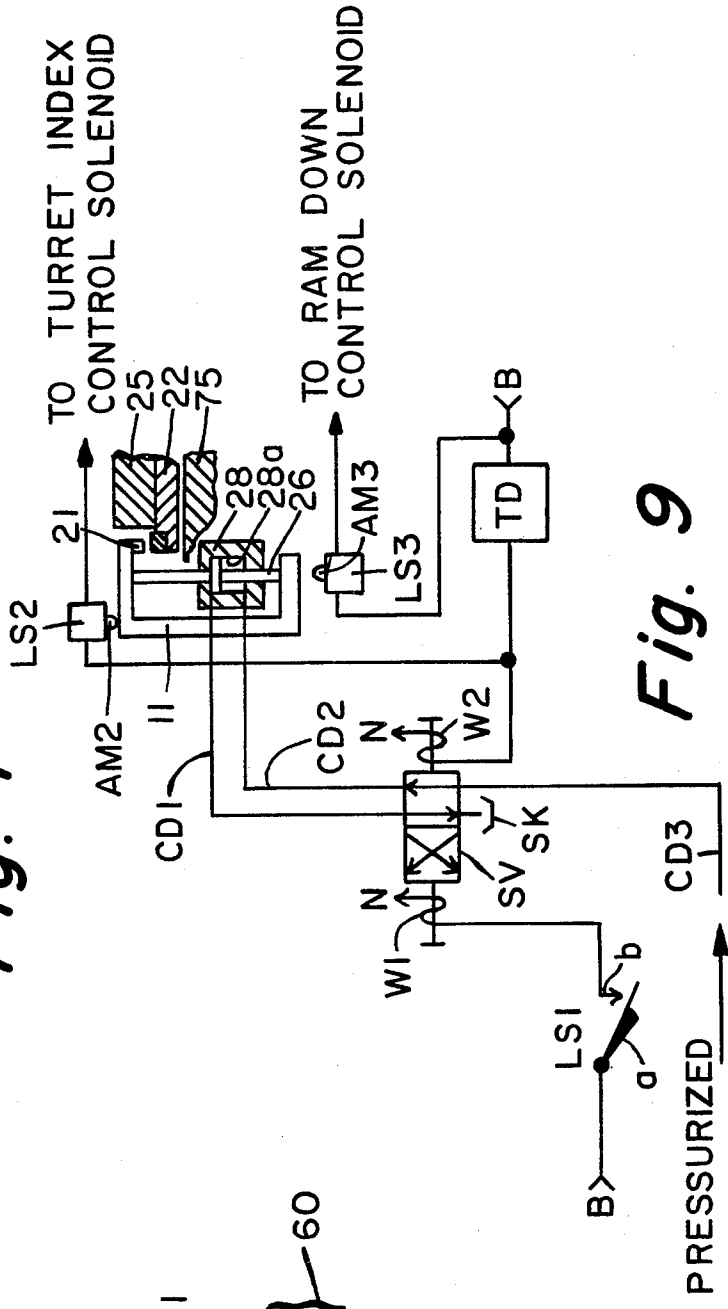


Fig. 9

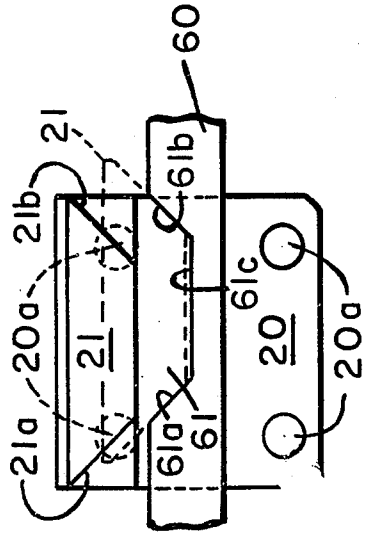


Fig. 8

COMBINED TURRET POSITIONER AND CLAMP ASSEMBLY FOR GLASS PRESSING MACHINE

BACKGROUND OF THE INVENTION

There is disclosed, for example, in U.S. Pat. No. 3,138,241, entitled "Glass Press Mold Turret" and issued June 23, 1964 to F. A. Dahlman, a locking means for the turret of a turret-type glass pressing machine and a hold-down device for holding the turret down against an anvil at a glass pressing position during press forming operations of such machine. Said locking means comprises a locking pin at the free end of a fluid operated piston for elevating the pin into a cooperative slot in the under side of the turret when a mold adaptor and mold carried by the turret is precisely positioned at the glass pressing position, and said hold-down clamp comprises a fluid operated hold-down device located at the glass pressing position and pivoted about a horizontal axis to actuate the turret downwardly into contact with said anvil following the aforesaid locking of the turret. It will be apparent that, in the apparatus of said patent, the elevating of the locking pin into said slot in the turret for the purpose of locking the turret against rotation cannot be performed until a mold adaptor is precisely positioned at the glass pressing station, and that the hold-down device must not be operated to actuate the turret into contact with the anvil at the glass pressing position until after said locking pin has been elevated for locking the turret against rotation.

For obvious economic reasons, it is expedient to operate a glass pressing machine at as high a rate of speed as possible in order to attain the maximum possible output from said machine in any selected period of time. Since the period of time required for a ram or pressing plunger to enter a glass charge in a mold, press form such charge and then move out of contact with the pressed charge depends substantially on the composition of the glass charge being pressed, it is virtually impossible to reduce said period of time below a certain minimum time period required for the press forming of the glass charge and the setting-up of the charge following the press forming thereof. Therefore, if the operation of a glass-pressing machine is to be increased in speed after said minimum time period is attained, such increase must be achieved by speeding up such machine during the so-called idle time of the pressing plunger or ram. Also, as is well known in the art, the indexing or periodic rotation of a turret type glass-pressing machine, such as disclosed in the aforesaid patent, is limited to a maximum speed due to the dynamics involved with such periodic rotation and the mobility of the glass charges in the forming molds of the pressing machine prior to the press forming thereof. Accordingly, when the minimum time period of the aforesaid pressing cycle and the maximum speed of said indexing operations are attained, the only way that additional speed of operation of a glass-pressing machine of the above-mentioned type can be achieved is to perform, to the extent possible, certain operations of the machine simultaneously. Thus, the combined turret positioner and clamp assembly of the present invention was developed, the object of such novel assembly being to start, during the latter part of each indexing movement of a machine of the aforesaid type, the precise positioning, at the glass pressing position, of each mold

adaptor and associated forming mold carried by the turret of the machine to such position, and to perform, at an earlier point in time than was heretofore possible following each said precise positioning of a mold adaptor and associated forming mold, the clamping of the machine turret to temporarily prevent further rotation thereof and to thereby temporarily maintain said mold adaptor and associated forming mold in their said precise position at the glass pressing position of the machine.

It is another object of the present invention to provide a simplified and, therefore, improved means or assembly for precisely positioning, at a glass pressing position, the mold adaptor and molds carried by the turret of a turret-type glass-pressing machine and for clamping such turret to temporarily maintain said precise positioning following each attainment thereof.

Other objects and characteristic features of the invention will become apparent as the description proceeds.

SUMMARY OF THE INVENTION

The invention is believed to be adequately summarized in the foregoing abstract of the disclosure and, therefore, to prevent repetition or redundancy, and for the sake of brevity of the disclosure to the extent possible, no further summary of the invention is considered necessary nor will any be given.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** is a front elevational view of a combined turret positioner and clamp assembly in accordance with the invention;

FIG. **2** comprises a cross-sectional view of the assembly of FIG. **1**, such view being taken generally along line **2—2** of FIG. **1**;

FIG. **3** is a side elevational view of the assembly of FIG. **1** and illustrates the mounting or attachment of the assembly on or to the anvil of a known glass pressing machine of the turret type;

FIG. **4** is a top plan view of a part of the assembly of FIG. **1**;

FIG. **5** is an elevational view of the assembly part of FIG. **4**, such view being taken generally along line **5—5** of FIG. **4**;

FIG. **6** is a top plan view of another part of the assembly embodying the invention;

FIG. **7** comprises an elevational view of the assembly part of FIG. **6**;

FIG. **8** is an elevational view of a portion of the assembly part of FIG. **7**, such viewing also including a clamp or clamp member of the assembly disclosed and also illustrating by solid lines such clamp member in an upper or non-clamping position, and by dotted lines the clamp member in a lower or clamping position; and

FIG. **9** is a diagrammatic and schematic view of the assembly embodying the invention and control means therefor.

Similar reference characters refer to similar parts in each of the FIGS. of the drawings.

Preferred Embodiment of the Invention

Referring to the drawings in detail, there is shown in FIGS. **1**, **2** and **3** the combined turret positioner and clamp assembly embodying the invention and comprising a support member **11** for a clamp member **20** in-

cluding a male wedge or wedge portion **21** and to be hereinafter discussed in detail. Member **11** has an upper or head portion **12** to which said clamp member **20** is attached as hereinafter discussed and an intermediate and lower portion **13** having a generally C-shaped configuration when viewing FIGS. **2** and **3**, such portion **13** including generally horizontally extending upper and lower arms **14** and **15**, respectively, which extend to the right when viewing such drawing Figures.

Arms **14** and **15** of support member **11** include, adjacent the otherwise free ends thereof, circular horizontal boss portions **16** and **17** respectively, which embody vertical passages **18** and **19**, respectively, through which extend the upper and lower ends, respectively, of a piston rod **26** of a motor means comprising a pressurized fluid cylinder **28** and such piston rod **26**, such rod extending through the bore **28***a* of the cylinder and having a central piston portion **27** integral with rod **26**. Such piston portion **27** has annularly thereabout a plurality of the usual piston rings such as **27***a* (FIG. **2**). The boss portions **16** and **17** of arms **14** and **15** of support member **11** snugly surround said respective upper and lower ends of piston rod **26** and each of said free ends of arms **14** and **15** are split or have vertical split openings therein leading into said passages **18** and **19** in boss portions **16** and **17**. Threaded bolts such as **29** and **30** (FIG. **2**) extend through boss portions **16** and **17** and through said split openings to secure or clamp arms **14** and **15**, respectively, to the upper and lower ends, respectively, of piston rod **26**, such arrangements being old and well known. A pair of upper and lower bushings or sleeve members, **31** and **32**, are provided in bore **28***a* of cylinder **28** at the upper and lower ends, respectively, of such bore and a pair of cap members **33** and **34** are bolted to the upper and lower ends of cylinder **28** to hold the sleeve members or bushings within bore **28***a* of cylinder **28**. Said bushings and cap members **31**, 32, 33 and **34** embody circular passages or bores **35**, 36, 37 and **38**, respectively, and the upper end of piston rod **26** extends snugly but slidably through said bores or passages **35** and **37** while the lower end of such rod similarly extends snugly but slidably through said bores or passages **36** and **38**.

Referring to FIGS. **4** and **5**, taken in conjunction with FIG. **1**, it will be noted that cylinder **28** is an integral part of a casting which also includes upwardly and outwardly extending arm portions **28***b* and **28***c*, which are guide arms for the upper or head portion **12** of support member **11**; and lower, outwardly extending flange portion **28***d* and **28***e* by which the assembly embodying the invention is, as hereinafter discussed in detail, mounted adjacent a glass pressing machine of the type hereinbefore mentioned. There is attached to the inner surfaces or faces of said extending arm portions **28***b* and **28***c* a pair of slide plates **40** and **41**, respectively, as shown in FIG. **1**. There is also attached to the outer faces of head portion **12** of support member **11** a pair of slide plates **42** and **43** which cooperate with slide plates **40** and **41**, respectively, to precisely guide the upper end of support member **11** to prevent lateral movement thereof. That is to say, guide plates **40** and **42** have extremely smooth facing and contacting surfaces **40***a* and **42***a* which slide on or against each other during vertical actuation of support member **11** and prevent leftward movement of member **11** (viewing FIG. **1**) during such actuation. Similarly, guide plates **41** and **43** have extremely smooth facing and contacting surfaces **41***a* and **43***a* which slide on or against each other during vertical actuation of support member **11** and prevent rightward movement of member **11** (viewing FIG. **1**) during such actuation.

Referring further to FIGS. **1** and **2** of the drawings, there is shown a pair of upper and lower pressurized fluid conduits CD1 and CD2, respectively which extend through a slot **11***a* embodied in support member **11** and are connected into passages P1 and P2, respectively, which extend through the wall of cylinder **28** into bore **28***a* embodied therein, such passages opening into such bore immediately below and above the lower and upper annular surfaces of bushings or sleeve members **31** and **32** in bore **28***a* of cylinder **28**. It will be readily apparent that pressurized fluid supplied to conduit CD1 and thence through passage P1 to bore **28***a* of cylinder **28** will actuate piston rod **26** downwardly in such bore while, similarly, pressurized fluid supplied to conduit CD2 and thence through passage P2 to bore **28***a* of cylinder **28** will actuate piston rod **26** upwardly in such bore. This will be discussed further hereinafter in conjunction with FIG. **9** of the drawings.

There is shown in FIGS. **1** and **3** a pair of upper and lower limit switches LS2 and LS3, respectively, which are mounted on a face of a suitable support plate **44** (left hand face viewing FIG. **3**) which is, in turn, (also viewing FIG. **3**) mounted on the left hand face of flange portion **28***e* of the aforesaid casting of cylinder **28**. An adjustable member **46** for contacting and actuating the push button or actuating member AM2 of switch LS2 is mounted on the upper part of a suitable support bracket **48** so that such push button or actuating member is contacted and actuated when support member **11** reaches a predetermined point in an upward movement thereof. Similarly, an actuating member **47** for contacting and actuating the push button or actuating member AM3 of switch LS3 is mounted on the lower part of support bracket **48** so that such push button or actuating member is contacted and actuated, as illustrated in FIGS. **1** and **3**, when support member **11** reaches a predetermined point in a downward movement thereof. Such actuations will be further discussed hereinafter in conjunction with FIG. **9**. It is pointed out that aforesaid support bracket **48** is attached to the right hand side (viewing FIG. **1**) of support member **11** and extends outwardly from such member in a left hand direction (when viewing FIG. **3**).

Referring now to FIGS. **6** and **7** there is shown a series of three arcuate rail segments such as **60** the center one of which is shown as embodying in the upper surface thereof a channel **61** having sloping ends **61***a* and **61***b* and a level bottom surface **61***c*. More accurately, channel **61** has an elevational or a vertical cross sectional configuration of an inverted truncated isoceles triangle and, preferably, such configuration is that of an inverted truncated right triangle with the right angle of such configuration being the truncated apex angle thereof. In other words, it is preferable that the aforesaid sloping ends **61***a* and **61***b* of channel **61** each meet the bottom or bottom surface **61***c* of such channel at an angle of about 135°. However such angles are not absolutely critical and each such angle may be an angle of a somewhat greater or lesser number of degrees than said preferred angle of 135°. Channel **61** may be considered to be the female mating member of a pair of male and female mating members as hereinafter further set forth.

Referring to FIG. 3 taken in conjunction with FIGS. 2 and 8, there is shown the previously mentioned clamp member 20 including a male wedge, or wedge portion or member 21, having sloping ends, that is, embodying an elevational or vertical cross-sectional configuration of an inverted truncated isoceles triangle corresponding to the aforesaid configuration of channel 61 in rail segment 60 (FIGS. 6 and 7) such wedge member being the male mating member of the aforesaid pair of male and female mating members and the wedge member being cooperative with the female members, such as channel 61, as hereinafter discussed in more detail. Member 20 is attached to upper portion 12 of support member 11 by bolts such as 20*a* (FIGS. 2 and 8).

It is believed expedient to point out, at this point in the description, the manner in which the combined assembly of the present invention is mounted and employed in conjunction with a glass pressing machine of the turret type such as, for example, shown in the previously cited patent to F. A. Dahlman, and how the aforesaid objects of the present invention are attained by the assembly disclosed. Reference is made to FIG. 3 of the drawings of the present application for such purpose.

There is shown in FIG. 3 portions of several parts of a glass pressing machine such as shown in said patent to Dahlman, such parts including an anvil such as 75 located at the glass pressing position of said machine, a mold adaptor support shelf 22 of the turret of such machine and a mold support or adaptor 25. A series or plurality of such adaptors are equally spaced apart in a circular row extending about shelf 22 adjacent the outer periphery thereof and are carried thereby, each such adaptor 25 (and a mold carried thereby) being periodically moved or indexed to the pressing position above anvil 75. (See FIG. 2 of the Dahlman patent.) The combined assembly of the present invention extends partially into a hollow or recess in the front of said anvil 75 or the left hand side of such anvil as illustrated in FIG. 3, and the assembly is precisely secured or securely attached to the anvil as by a plurality of four threaded bolts such as 64 (FIG. 3) inserted through suitably cooperative countersunk holes such as 65 extending through portions 28*d* and 28*e* of the foresaid casting of cylinder 28 (FIGS. 1, 3 and 5) and into cooperatively threaded holes such as 66 provided in anvil 75 as shown in FIG. 3.

It will be understood that a series or succession of the arcuate rail segments such as 60 shown in FIGS. 3, 6, 7 and 8 are disposed about the outer periphery of the aforesaid shelf 22 of the turret of a glass pressing machine such as disclosed in the Dahlman patent with such series or succession of rail segments being slightly spaced apart and the series thus forming a circular rail means extending about said periphery with one of such rail segments being respectively associated with each of the mold adaptors such as 25. The rail segments such as 60 are affixed to said shelf 22 so that a centerline of the channel such as 61 in each said rail segment, each such centerline being equally spaced from the ends 61*a* and 61*b* of each respective channel 61, is precisely aligned with the center of the respectively associated adaptor when such adaptor is precisely positioned at the glass-pressing position of the machine of said patent. The assembly of the present invention is, as previously mentioned, secured or attached to anvil 75 (FIG. 3) and such assembly is so secured or attached so that the centerline of the wedge, wedge portion or wedge member 21 is precisely aligned with said centerline of the channel such as 61 in each rail segment such as 60 when each such segment is moved to the pressing position of said glass pressing machine, said centerline of wedge 21 being a line equally spaced from the sloping ends 21*a* and 21*b* of such wedge.

Referring to FIG. 9 of the drawings, some of the parts shown schematically therein are designated by the same reference characters as the corresponding parts in the other FIGS. of the drawings as is believed readily apparent. It is also pointed out that the pressurized fluid indicated in FIG. 9 is from the same source used for operation of the glass pressing machine of the Dahlman patent and that a source of direct electrical current of suitable voltage and capacity is provided for actuation or operation of some of the parts of the assembly illustrated in FIG. 9. However, for purposes of simplification of the drawings such source is not shown therein but its positive and negative terminals are designated B and N, respectively.

There is also shown in FIG. 9 an electrical solenoid-actuated fluid flow control valve SV including solenoid windings W1 and W2, a set of contacts *a–b* of a limit switch LS1 and a timing drum illustrated merely by a rectangle designated TD, such timing drum being the usual timing drum associated with and provided for the control of a glass pressing machine such as that of the aforesaid patent to Dahlman. Said set of contacts *a–b* of limit switch LS1 are shown as being open or in an electrical circuit interrupting position or condition, and such contacts are at times actuated to a closed or electrical circuit closing position or condition as discussed below. It will be noted that, in FIG. 9, piston rod 26 and, therefore, support member 11 and wedge 21 are illustrated as in their raised or upward positions and, therefore, the lower surface of shelf 22 of the turret is shown slightly spaced from the upper surface of anvil 25. In FIG. 3 wedge 21 is shown in its lowered or turret positioning, and locking or clamping position and, therefore, the lower surface of shelf 22 of the turret is shown contacting the upper surface of anvil 25.

OPERATIONAL EXAMPLE OF THE INVENTION

With reference to FIG. 9, taken in conjunction with FIG. 3 of the drawings, it will be assumed that contacts *a–b* of limit switch LS1 are open because the glass pressing machine, with which the disclosed turret positioner and clamp assembly is employed, has just finished a press-forming operation and an indexing movement of the turret of such machine is occuring or taking place. As the machine turret and its shelf 22 move a mold carried by a mold adaptor such as 25 towards the glass-pressing position of the glass pressing machine, an associated arcuate rail section such as 60, associated with the respective mold adaptor and the carried mold, is also correspondingly moved, as is believed readily apparent. When such parts are moved a distance such that the leading upper edge of end 61*a* of channel 61, in the arcuate rail section 60 approaching the glass-pressing position, is generally vertically aligned with, that is, is vertically below the corresponding lower edge of wedge or wedge member 21, that is, is vertically below the lower edge of end 21*a* of wedge or wedge member 21 (FIG. 8) the set of contacts *a–b* of limit switch LS1 (FIG. 9) are immediately and speedily actuated closed, such actuation being performed, for example, by a suitable device provided on a part of the glass

pressing machine, which such device contacts the actuating arm or button of switch LS1 at such time. Such actuating device may, for example, be carried on or by arm **70** (FIG. 1 of the Dahlman patent) and switch LS1 may be located on said machine so that its said actuating arm or button is contacted and actuated by the actuating device when the above described point in the movement of a rail segment such as **60** by the glass-pressing machine is reached. In any event, the set of contacts *a–b* of switch LS1 are actuated closed each time a rail segment such as **60**, approaching the glass-pressing position of the machine, moves its channel such as **61** into the alignment described. (See FIG. **8**.)

Previously mentioned pressurized fluid valve SV is shown in FIG. **9** as in a position such that it is supplying pressurized fluid from conduit CD3 through such valve (viewing FIG. **9**) to conduit CD2 and thence to the lower end of bore **28***a* in cylinder **28** to actuate the parts of the assembly to their positions shown in FIG. **9**, the upper end of said bore being connected through conduit CD1 and valve SV to a fluid sink SK at such time. When, however, contacts *a–b* of switch LS1 are actuated closed as discussed above, a circuit is closed for energizing solenoid winding W1 of valve SV, such circuit extending from said terminal B of the previously mentioned source of electric current, over said contacts *a–b* of switch LS1 and thence through winding W1 to terminal N of the current source. This shifts valve SV so that the pressurized fluid flows from conduit CD3 through the valve to the upper end of bore **28***a* of cylinder **28**, the lower end of bore **28***a* being connected through the valve to said fluid sink SK at such time. The pressurized fluid, at such time, actuates the piston of piston rod **26** downwardly and such rod in turn, moves support member **11** and wedge support member **20** also downwardly, with wedge or wedge member **21** being actuated downwardly towards channel **61** which is being moved, by its respective arcuate rail segment such as **60**, to the glass-pressing position of the glass pressing machine. It will therefore be seen, with reference to FIG. **8**, that the wedge, wedge portion or wedge member **21** starts to move downwardly towards and into a channel such as **61** of a rail segment such as **60** at a point in time prior to the completion of an indexing movement of the glass pressing machine, that is, prior to the completion of a movement of a mold adaptor such as **25** and its carried mold to the glass-pressing position of the machine. Such downward movement of said wedge or wedge member **21** into said channel such as **61** is performed simultaneously with the last part of said indexing movement, and such downward movement initially causes the lower part of end **21***a* of wedge **21** to contact the upper part of end **61***a* of said channel **61**. Subsequent continued downward actuation of wedge **21** causes said end **21***a* of the wedge to slide downwardly over said end **61***a* to thereby aid in the completion of the machine indexing movement which occurs in an extremely short period of time thereafter. Further continuing downward movement of the wedge or wedge member **21** causes the lower part of sloping end **21***b* of such member to contact end **61***b* of channel **61** (FIG. **8**). Thus, shelf **22** of the machine turret, and the adaptor such as **25** and its carried mold are precisely positioned at the glass-pressing position. Subsequently, the continuing downward movement of wedge or wedge member **21** presses the lower surface of turret shelf **22** into firm contact with the upper surface of anvil **75**, as shown in FIG. **3**, to clamp turret shelf **22**, such clamping preventing rocking movement of such shelf, adaptor **25** and its carried mold when the ram of the glass pressing machine and, thereby, the forming plunger of such machine, are actuated downwardly and such forming plunger moves into press-forming engagement with a glass charge or gob in said mold.

With further reference to FIGS. **1**, **3** and **9** of the drawings, it will be noted that, when support member **11** was moved downwardly a selected distance, actuating member AM3 of limit switch LS3 was contacted and actuated by member **47**. Such actuation of limit switch LS3 closed a normally open contact in such switch and there was prepared an electrical circuit for a ram down control solenoid of a valve which controls the supply of pressurized fluid to said ram of the glass pressing machine, such contact of switch LS3 in said circuit assuring that the aforesaid positioning and clamping has been performed prior to actuation of said ram. Said valve and solenoid, and said ram, do not, per se, form part of the present invention and, therefore, are not shown in the drawings for purposes of simplification thereof.

Following the pressing of a glass charge or gob as mentioned above, a contact in timing drum TD (FIG. **9**) is closed and solenoid winding W2 of valve SV is energized over a circuit extending from terminal B of the electric current source over said closed contact in timing drum TD and thence through said winding W2 to terminal N of the current source. The energization of winding W2 of valve SV shifts such valve to again connect, through such valve, conduit CD3 to conduit CD2 to again supply pressurized fluid to the lower end of bore **28***a* of cylinder **28** and to connect the upper end of such bore through conduit CD1 to fluid sink SK. This causes upward actuation of piston **27** of piston rod **26** and of such rod and support member **11** to cause withdrawal of wedge or wedge member **21** from its positioning and clamping relationship with the channel such as **61** in the respective rail segment such as **60**.

The above discussed upward actuation of support member **11** causes member **46** (FIGS. **1** and **3**) to contact actuating member AM2 of limit switch LS2 and reclose a contact of such switch to prepare, along with the aforesaid closed contact in timing drum TD, an energizing circuit for a control solenoid of a valve controlling the supply of pressurized fluid to the turret indexing apparatus of the glass pressing machine, such apparatus being omitted from the drawings for purposes of simplification thereof and because such apparatus does not, per se, form part of the present invention. Said contact of switch LS2 assures that the turret positioning and clamping are no longer in effect and that wedge or wedge member **21** is raised or is at least in transit to its raised position before an indexing movement of the machine turret can be performed. It should be pointed out that, following the previously discussed indexing movement of the machine turret, turret shelf, mold adaptor and the mold carried thereby, the aforesaid device, which actuated limit switch LS1 to close contacts *a–b* of such switch and operated, for example, by the movement of the indexing arm **70** of the machine of the Dahlman patent, becomes unactuated by the return movement of such arm to its preparatory machine indexing position and, therefore, said contacts *a–b* of limit switch LS1 are opened when such arm **70**

leaves the end of the machine indexing path of movement of the arm. Thus, winding W1 of valve SV became or becomes deenergized at such time and, when winding W2 of such valve is energized as discussed above, valve SV is shifted or returned to its prior position illustrated in FIG. 9, there being no interference with such shifting of valve SV due to the continued energization of winding W1 of such valve.

It is pointed out that the male and female mating members of the pairs of mating members, comprising each channel such as 61 and the wedge or wedge member such as 20, could be changed about or reversed if found desirable or expedient to do so. That is to say, each of the arcuate rail segments such as 60 (FIGS. 6 and 7) could be substantially thinner and include on the upper surface thereof a male mating member (wedge or wedge member) having a configuration such as that of wedge or wedge member 21 (FIG. 8) and there could be embodied in a support member such as 20 a female mating member (channel) having a configuration such as that of each channel such as 61 in each rail segment such as 60. However, the preferred embodiment of the invention is as shown and discussed in detail herein.

It is believed expedient to point out that a glass pressing machine such as shown in the cited patent to Dahlman was tested for maximum operating speed prior to the substitution of the combined turret positioner and clamp assembly of the present invention for the separate turret positioner and turret clamp shown and described in said Dahlman patent. The highest speed of operation obtained during such test of said machine was 53 cycles or indexing movements of the machine per minute, which, of course, means that the maximum number of pieces of ware that were able to be produced on said machine was 53 pieces per minute. Following the substitution of the combined turret positioner and clamp assembly of the present invention for the prior separate turret positioner and turret clamp, such as disclosed in the Dahlman patent, another test was made and the maximum speed of operation of the glass pressing machine was then 62 cycles or indexing movements of the machine per minute, thereby, resulting in the production of 62 pieces of ware per minute or a percentage increase in production on the order of 15+ percent.

Although there is herein shown and described only one form of apparatus embodying the invention, it will be understood that such is not intended to be in any way limiting but that various changes and modifications may be made therein within the purview of the appended claims without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination with a rotatable turret of a turret-type glass pressing machine having a circular row of mold adaptors equally spaced apart about a peripheral portion thereof with means adapted to successively index said adaptors to each of a plurality of positions including a glass pressing position at which an anvil is arranged under and adjacent to said turret in close proximity thereto, a combined turret positioner and hold-down clamp assembly for said glass pressing position, such assembly comprising;

A. circular rail means including a plurality of similar arcuate and slightly spaced apart rail segments extending about said turret adjacent the outer periphery thereof and equal in number to said mold adaptors, each such rail segment embodying in the upper surface thereof a channel, each such channel being congruent with the others and each having a vertical cross-sectional configuration of an inverted truncated isoceles triangle and each rail segment being similarly located adjacent an associated one of said mold adaptors with the channel in the respective segment precisely positioned in relation to the respectively associated adaptor;

B. a vertically actuable wedge member at said glass pressing position, said wedge member including a portion having a cross-sectional configuration corresponding to said configuration of each said channel and such wedge portion being normally positioned above said rail means in close proximity thereto;

C. motor means for actuating said wedge member downwardly and said wedge portion into each said channel as each respective rail segment is indexed to said glass pressing position and for thereafter actuating such wedge portion out of each such channel; and

D. control means for energizing said motor means in a first mode to start said downward actuation of said wedge member as the leading upper edge of each respective channel is moved vertically below the corresponding lower edge of the wedge portion of such wedge member and to continue such downward actuation until the ends of the wedge portion are in firm contact with the ends of the respective channel and said turret is actuated into firm contact with said anvil, and for thereafter energizing said motor means in a second mode to actuate said wedge portion upwardly out of each respective channel.

2. A combined turret positioner and hold-down clamp assembly in accordance with claim 1 and in which said cross-sectional configurations of said channels and said wedge portion are those of truncated right triangles with the right angle of each such configuration being the truncated apex angle of the configuration.

3. A combined turret positioner and hold-down clamp assembly in accordance with claim 1 and in which said motor means comprises a pressurized fluid actuated cylinder and its associated piston rod.

4. A combined turret positioner and hold-down clamp assembly in accordance with claim 2 and in which said motor means comprises a pressurized fluid actuated cylinder and its associated piston rod.

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