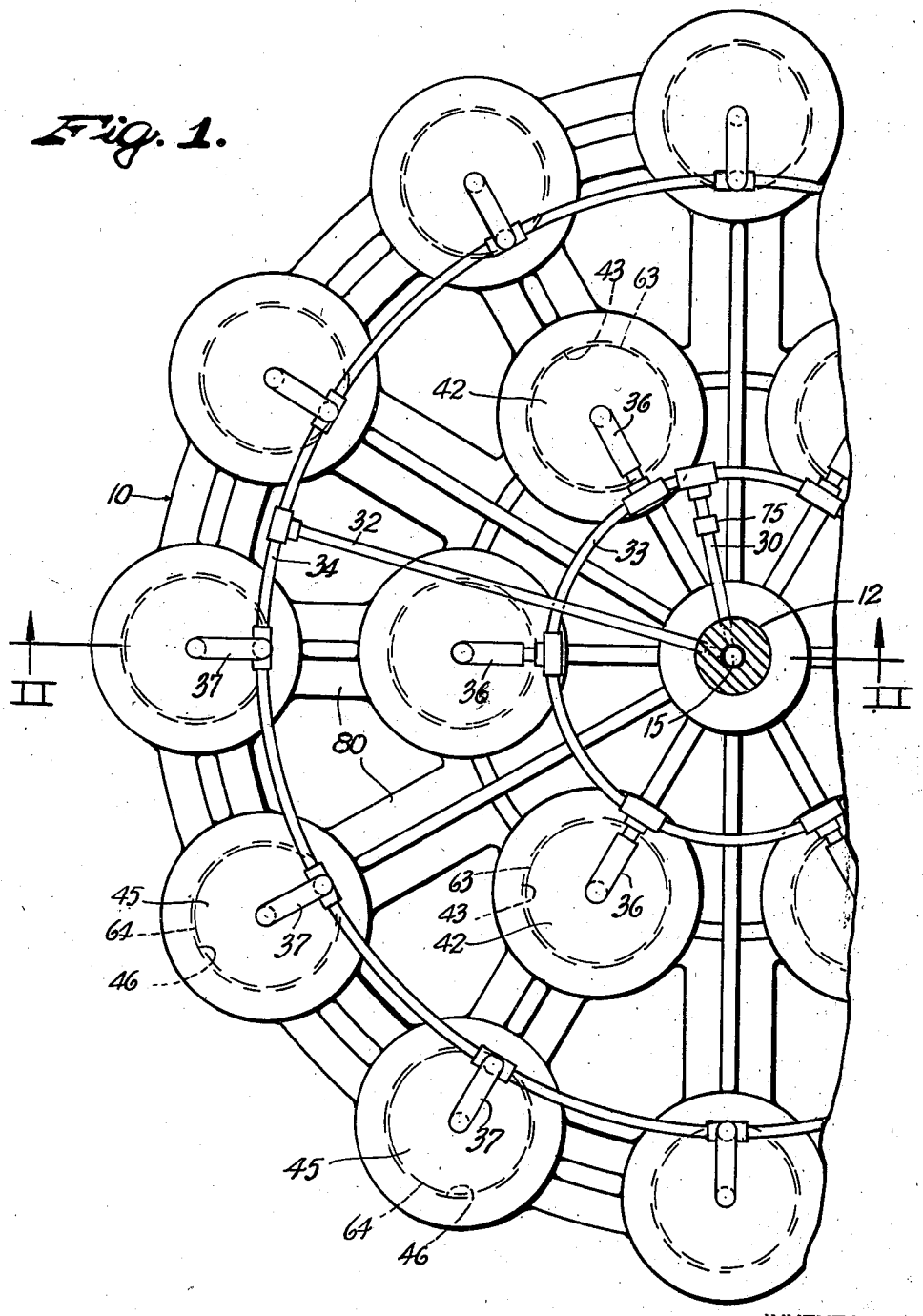
Nov. 25, 1941. A. L. HARRINGTON 2,264,177

CONTROL MECHANISM FOR SURFACING APPARATUS

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Fig. 1.



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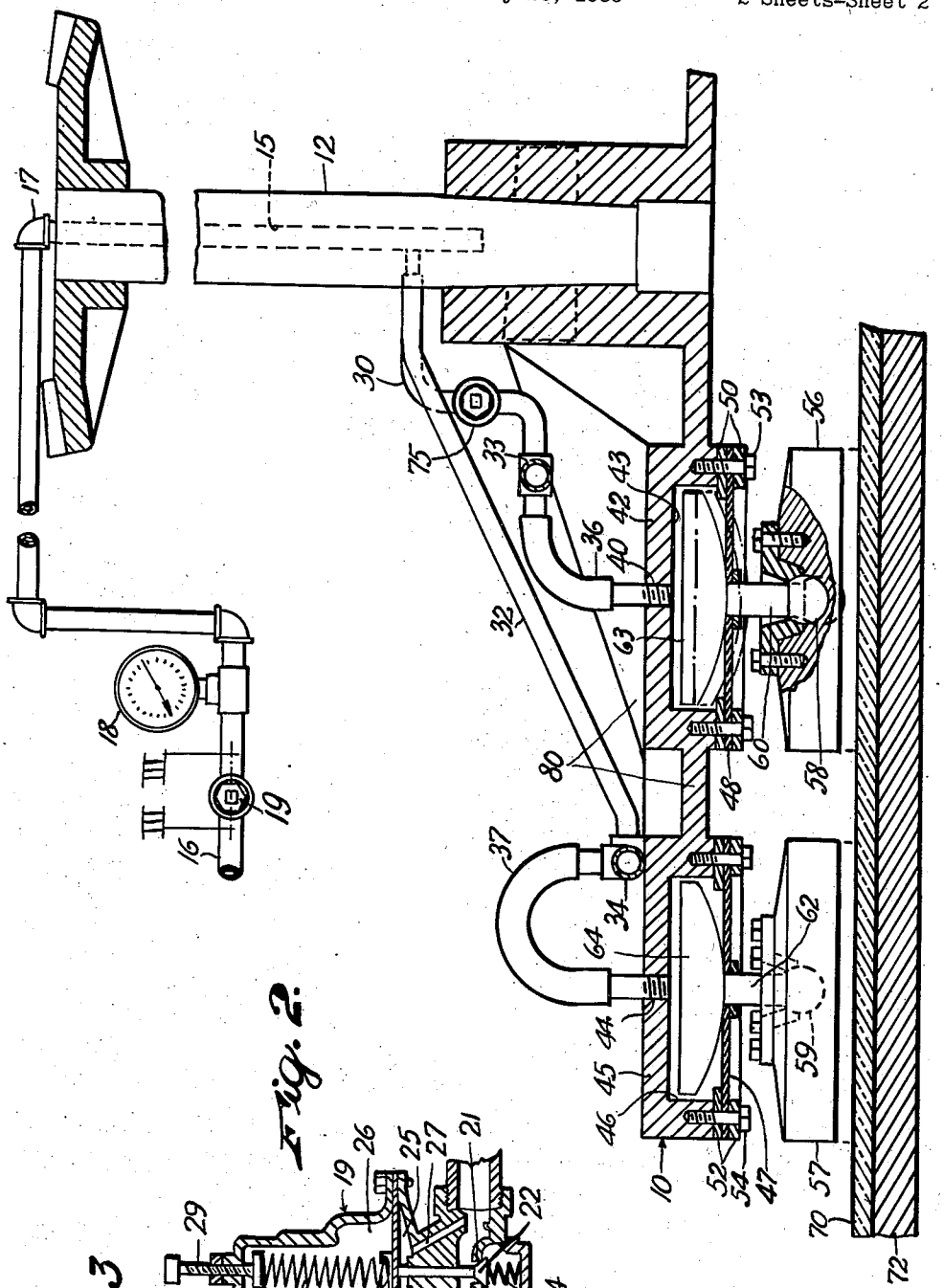


Fig. 2.

Fig. 3.

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Patented Nov. 25, 1941

2,264,177

UNITED STATES PATENT OFFICE

2,264,177

CONTROL MECHANISM FOR SURFACING APPARATUS

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Application July 26, 1939, Serial No. 286,576

4 Claims. (Cl. 51—209)

This invention relates to surfacing apparatus for grinding or polishing plate glass and it has particular relation to pressure control mechanism for regulating the application of the runner blocks to glass surfaces.

One object of the invention is to provide an improved mechanism for controlling and varying pressure exerted by runner blocks upon work to be surfaced.

Another object of the invention is to provide an improved arrangement for pneumatically controlling the runner blocks of a surfacing apparatus.

In one arrangement of runner blocks constructed according to the invention, conduits are provided which pass through a rotatable trunk unit, and pressure chambers formed within the walls of the unit are provided with diaphragms for supporting the runners. In the type of surfacing apparatus in which inner and outer rows of runner blocks are employed, a series of fluid supplying conduits are connected to the chambers of the inner series and a similar series of fluid supplying conduits are connected to the outer series. Pressure regulating mechanism is provided in the fluid supply conduits leading to the chambers in which the diaphragms are located for the purpose of regulating the pressure on all of the runner blocks, or on only a selected number of them.

In the drawings:

Figure 1 is a fragmentary plan of a surfacing unit; Fig. 2 is a fragmentary vertical section taken substantially along the line II—II of Fig. 1; and Fig. 3 is a fragmentary cross section, on a larger scale, taken substantially along the line III—III of Fig. 2.

In practicing the invention, a surfacing trunk or spider 10 is rigidly supported upon a rotatably driven shaft 12 vertically disposed and adapted to be mounted in a conventional manner. This shaft 12 is provided with an axial conduit 15 extending from the upper extremity thereof downwardly to a location adjacent its lower end. A fluid supply main 16 for supplying fluid under pressure from suitable pressure source (not shown) is provided with a swivel connection 17 securing it to the vertical shaft 12 in communication with the conduit 15. This arrangement facilitates relative rotation between the shaft 12 and the fluid supplying main 16. A suitable gauge 18 is incorporated in the fluid supply main 16 to indicate the degree of pressure exerted by the fluid entering the shaft conduit 15 and also a pressure regulator 19 of conventional construction is included in the main 16 to vary the degree of pressure exerted by the fluid passing into the conduit 15.

One form of regulator 19 which has been found to be satisfactory includes a sectional casing 20 (Fig. 3), the lower section of which has a passage 21 communicating on opposite sides with the conduit 16 and controlled by an oblong valve 22 having its outer end resting against a diaphragm 23 and its valve end urged toward the passage 21 by means of a spring 24 that rests against an adjacent wall of the casing 20. The diaphragm 23 divides the outer portion of the casing into inner and outer compartments 25 and 26 and the inner compartment 25 communicates through a duct 27 with the conduit 16 on the side of the regulator leading to the passage 15. A spring 28 rests at one end upon the outer side of the diaphragm 23 and at its other end upon the inner end of an adjusting member 29 that is screw-threaded into the outer extremity of the casing 20. Control of relative pressures on opposite sides of the valve 22 can be effected by adjustment of the spring pressure on the diaphragm 23 which is exposed to the pressure in the conduit 16 leading to the shaft passage 15.

Two conduits 30 and 32 substantially radially disposed with respect to the lower portion of the shaft 12 are connected at their inner ends with the shaft conduit 15 and at their outer ends with two endless circular conduits 33 and 34, respectively, both of the latter of which surround the shaft 12 in spaced relation. Two series of inner and outer conduit connections 36 and 37 are connected radially at intervals along the endless conduits 33 and 34, respectively, and each of the inner series of conduit sections 36 is connected at its outer end in an opening 40 formed in the upper wall 42 of one of a series of inner chambers 43 which are radially disposed in a circular row along an intermediate portion of the spider 10. Likewise each of the series of outer conduit sections 37 is connected in an opening 44 formed in the upper wall 45 of one of a series of outer chambers 46 which are radially disposed in a circular row along the marginal portion of the spider 10.

The inner and outer chambers 43 and 46 are provided with lower walls in the form of diaphragms 48 and 47, respectively, composed of rubber, rubberized fabric, or other flexible or resilient material. Marginal portions of the diaphragms 48 and 47 are clamped between rings 50 and 52, respectively, that are bolted, as indicated at 53 and 54, in fluid tight relation to the bottom side of the spider 10.

The two series of diaphragms 48 and 47 support two series of surfacing runner blocks 56 and 57, respectively, which are provided with centrally located ball and socket connections 58 and 59. Vertical arms 60 and 62, the lower ends of which form portions of the ball and socket connections rigidly carry at their upper ends counterweights 63 and 64, respectively, that are disposed inside the chambers 43 and 46. These arms 60 and 62 extend centrally and downwardly from the counterweights 63 and 64, respectively, through central portions of the diaphragms 48 and 47, respectively, and are connected in fluid tight relation therewith in conjunction with their mounting upon the respective counterweights. The flexibility and resiliency of the diaphragms 48 and 47 permit slight tilting of the vertical arms 60 and 62, respectively, and slight vertical movement of the runner blocks 56 and 57, respectively. These runner blocks are thus so mounted that they respond to any surface variations in a glass plate 70 which is carried upon a support 72 in a conventional manner and is to be surfaced by the operation of the runner blocks.

A fluid pressure regulator 75, having substantially the same construction as the regulator 19 described above, is included in the conduit 30 and can be set to insure any degree of fluid pressure desired in the chambers 43, such pressure differing as desired from that existing in the chambers 46. Also by adjusting the pressure regulator 19 in the fluid supply main 16, the fluid pressure in all of the chambers of the surfacing unit can be regulated. Therefore, the inner and outer runner blocks 56 and 57 can be so adjusted with respect to pressure applied to the glass as to insure proper surfacing of the glass and whenever any inequalities occur in the glass surface, the pressures can be regulated to correct them and produce a surface free from irregularities.

The walls 42 and 45 are rigidly connected as parts of the rotatable surfacing unit by means of webbing 80.

Although only one form of the invention has been shown and described in detail, it will be apparent to those skilled in the art that the invention is not so limited, but that various changes can be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. In a surfacing unit having two series of chambers formed on the lower side thereof, diaphragms constituting the lower walls of said chambers, surfacing runner blocks carried by said diaphragms, conduit structure communicating with said chambers for supplying fluid under pressure to the chambers against said diaphragms, and means for regulating the fluid pressure in one series of chambers independently of the fluid pressure in the other series of chambers.

2. In a surfacing unit having two series of chambers formed on the lower side thereof, diaphragms constituting the lower walls of said chambers, surfacing runner blocks carried by said diaphragms, conduit structure communicating with said chambers for supplying fluid under pressure to the chambers against said diaphragms, means for regulating the fluid pressure in both series of chambers, and means for regulating the fluid pressure in one series of chambers independently of the fluid pressure in the other series of chambers.

3. In a surfacing unit having runner blocks adapted to smooth the surface of a glass plate, a plurality of chambers each having a substantially horizontal and flexible diaphragm forming one wall thereof, a support carrying the chambers and having a vertical axis of rotation about which the chambers are revolvable, said runner blocks having counterweights connected thereto and supported in said chambers upon the diaphragms to balance the effect of centrifugal force tending to tilt the runner blocks in connection with their revolving action about said vertical axis.

4. In a surfacing unit having a member formed with a chamber at the lower side thereof, a diaphragm constituting the lower wall of said chamber, a surfacing runner block having an upward extension connected thereto and projecting through the diaphragm, a support carrying the chambered member and having a vertical axis of rotation about which the chambered member is revolvable, and a counterweight carried on said extension inside the chamber and at least partially supporting said runner block on the diaphragm to balance the effect of centrifugal force tending to tilt the runner block in connection with its revolving action about said vertical axis.

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