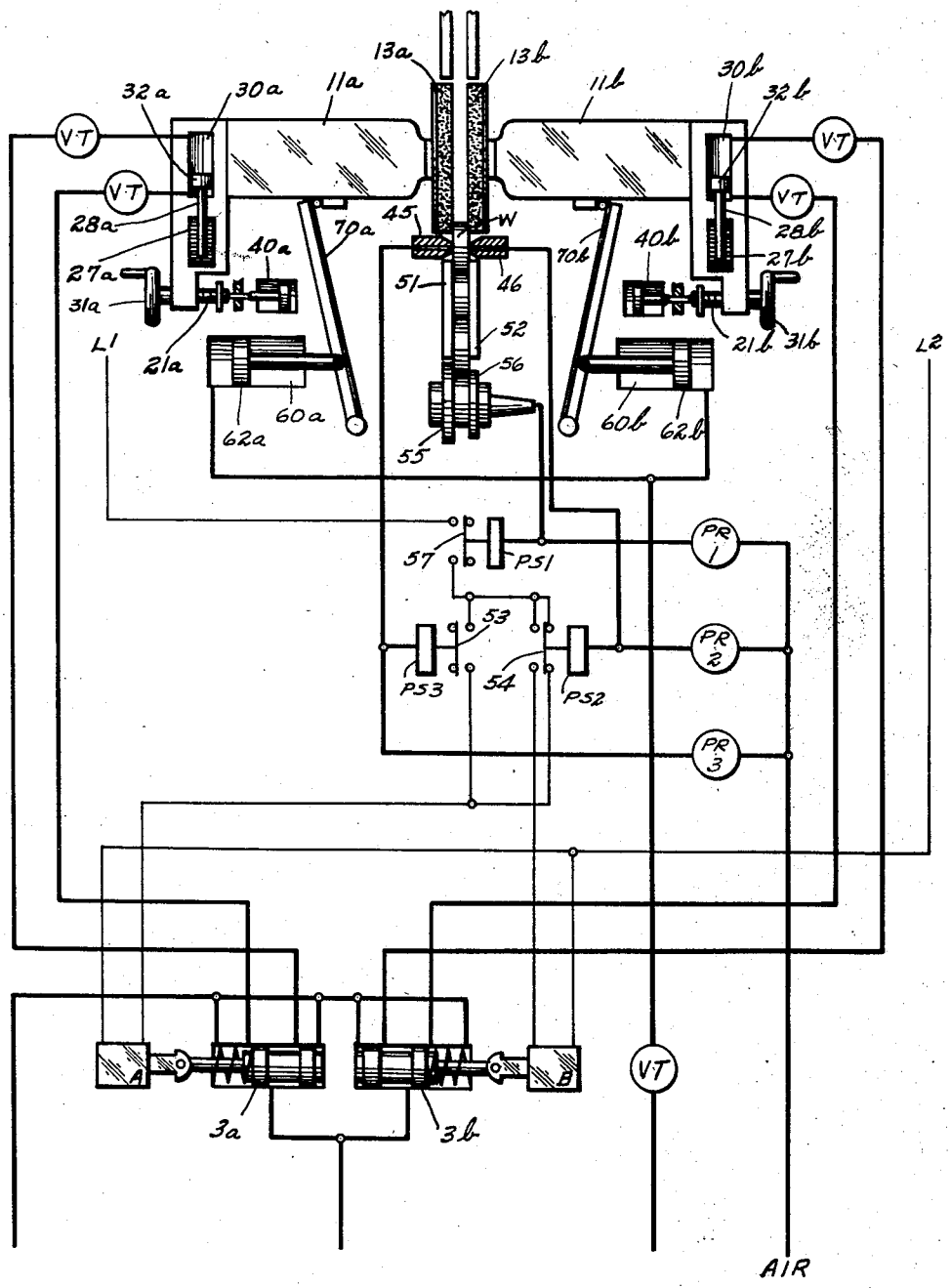
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SELECTIVE CONTROL DEVICES FOR DISC GRINDERS

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SELECTIVE CONTROL DEVICES FOR DISC GRINDERS

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5 Claims. (Cl. 51—112)

This invention relates to disc grinders, particularly to size control devices for such machines.

An object of this invention is to provide measuring devices directed against opposite sides of a workpiece as it emerges from between opposed grinding discs for determining which requires adjustment for wear as indicated by oversize condition of the work.

Another object of this invention is to provide means for effecting the indicated adjustment after the work has emerged completely from between the discs.

The single figure of the drawing includes a pneumatic and electric diagram.

The machine on which the apparatus of the invention is mounted is similar to that disclosed in co-pending application S. N. 594,863, filed June 29, 1956.

In the drawing, numerals **11***a* and **11***b* indicate supporting members for annularly opposed abrasive discs **13***a* and **13***b*. The hydraulic motor consisting of cylinders **40***a* and **40***b* serve to retract discs **13***a* and **13***b* from grinding position. Another motor consists of cylinders **60***a* and **60***b* and pistons **62***a* and **62***b* which actuate two levers **70***a* and **70***b* to move said abrasive discs toward one another. The head ends of each of said cylinders is always under constant air pressure.

Means is also provided for effecting incremental movement of each of said discs including a motor having cylinders **30***a* and **30***b* and pistons **32***a* and **32***b* for actuating pawls **28***a* and **28***b* and ratchets **27***a* and **27***b*. Said ratchets function through suitable gearing to rotate feed screws **21***a* and **21***b* to advance said abrasive discs toward one another. The means for selectively controlling the flow of actuating fluid to opposite ends of cylinders **30***a* and **30***b* consists of a pair of oppositely disposed nozzles **45** and **46** adjacent the point of exit of the workpiece from between the grinding discs. A supply of air for said nozzles **45** and **46**, which is provided through pressure regulating valves PR3 and PR2 respectively, is also connected to pressure switches PS3 and PS2 respectively. As the workpieces emerge from the grinding discs and move past said nozzles, they enter a space between guide members **51** and **52**. After passing through said guide members, the workpieces must pass a gauging device consisting of a stationary member **55** and a movable plunger member **56** of conventional construction for controlling the escape of air in accordance with the space between said members which is also the size of the workpiece. Said plunger member **56** is connected through a regulating valve PR1 to a supply of air which also acts on the air pressure switch PS1 when the escape of air from said plunger **56** is restricted.

Operation

When a workpiece W emerges from between the grinding discs, it is checked by nozzles **45** and **46**. If the workpiece is closer to one nozzle than the other, indicating oversize due to wear of the corresponding grinding disc, the air flowing from said nozzle will be restricted and the corresponding pressure switch will be actuated to close one of the contacts **53** or **54** in the circuit to one of the valve solenoids A or B. When said oversize workpiece passes between the members **55** and **56**, the pressure operated switch PS1 is actuated to close a contact **57** to complete a circuit from L1 to contact **53** of pressure switch PS3 or contact **54** of pressure switch PS2. Closing PS3 or PS2 will complete a circuit to energize valve solenoids A or B to shift valves **3***a* or **3***b* to direct fluid under pressure to the rod end of cylinders **30***a* or **30***b*. Pistons **32***a* or **32***b* through piston rods **28***a* or **28***b* and ratchets **27***a* or **27***b* will rotate feed screws **21***a* or **21***b* to advance discs **13***a* or **13***b* in the direction of the other whereby to restore the operating surfaces of the discs to alignment with guides **51** and **52** and spaced apart a distance equal to the desired thickness or size of the workpiece.

If a workpiece surface is not sufficiently out of line to actuate either of the pressure switches PS2 or PS3 as it passes between the nozzles **45** and **46**, it may still cause an adjustment of one of the discs when it passes through the gauge members **55** and **56** since this gauge is more sensitive than the nozzles.

If neither of the nozzles transmits a signal, there is no selection as to which disc is to be fed. However, under these circumstances, any signal for feeding transmitted from the gauge member **56** acts to close contact **57** and complete a circuit from L1 through the normally closed contact **54** of PS2 to energize valve solenoid A and direct fluid under pressure through valve **3***a* to the rod end of cylinder **30***a* to effect a feeding movement of wheel support **11***a* and disc **13***a* toward the opposing disc **13***b*. This intermittent feeding of disc **13***a* will continue until the nozzles **45** or **46** indicate an out of alignment condition sufficient to cause nozzle **46** to actuate pressure switch PS2 to close a contact in the line leading to valve solenoid B. Thus, when the slightly oversize workpiece passes through the gauge members **55** and **56**, a circuit will be completed through contact **57** of PS1 and normally closed contact **54** of PS2 to said solenoid to shift valve **3***a* and direct fluid under pressure to the rod end of cylinder **30***a*. Piston **32***a* actuates ratchet **27***a* to turn feed screw **21***a* to provide one or more increments of feed to disc **13***a* to restore the normal relation between the discs and the centerline of the workpiece and the guide surfaces and thus assure proper size of the ground workpiece.

If both discs **13***a* and **13***b* are worn sufficiently, the position of the workpiece surfaces as the workpiece emerges from between said discs, will be such as to restrict the air from both of the nozzles **45** and **46**. This will close contacts **53** and **54** so that when the work passes between members **55** and **56**, contact **57** of pressure switch PS1 will complete the circuit through both of the contacts **53** and **54** to energize valve solenoids A and B. Valves **3***a* and **3***b* will thus be shifted to direct fluid under pressure to the lower ends of cylinders **30***a* and **30***b*. Pistons **32***a* and **32***b*, through piston rods **28***a* and **28***b* and ratchets **27***a* and **27***b*, will rotate feed screws **21***a* and **21***b* to advance discs **13***a* and **13***b* toward one another whereby to restore the operating surfaces of said discs to alignment with guides **51** and **52**.

I claim:

1. In a disc grinder having annularly opposed grinding discs, guide plates for guiding a workpiece as it emerges from between said discs, means for feeding each of said discs toward and from the other, control means on both sides of a workpiece as it emerges from between the grinding discs, said means serving to determine whether either or both sides of a workpiece is in proper alignment with said guides and hence, whether either or both of said discs requires adjustment, means actuated by said control means for effecting actuation of said feeding means to adjust one or both of said discs axially, a second control

element co-acting with one side of a workpiece to detect oversize workpieces, means actuated by the second control element for completing a circuit to one or both of said feed actuating control means depending upon whether one or both discs require adjustment.

2. In a disc grinder having annularly opposed grinding discs, each having means for feeding one toward and from the other, control means at both sides of a workpiece and responsive to the position of the work surface while part of said surface is still being ground, said means serving to determine whether one or both sides of a workpiece is in proper alignment and thus whether the discs are properly spaced and positioned, means actuated by said control means for effecting operation of said feeding means to adjust one or both of said discs axially, a second control element co-acting with a workpiece and positioned to be affected by the workpiece only after said workpiece has emerged completely from between the grinding discs to detect oversize workpieces, and means actuated by the second control element for completing a circuit to one or both of said feed actuating control means after said workpiece is clear of the grinding discs.

3. In a disc grinder having annularly opposed grinding discs, each having means for feeding one toward and from the other, a carrier for transporting workpieces between said opposed discs for a grinding operation, guide means in alignment with said grinding discs for receiving workpieces as they emerge from between said discs, a control device having elements for coacting with opposite sides of a workpiece while part of said workpiece is still being ground, such control means serving to determine whether either or both of said discs is worn beyond prescribed limits as evidenced by the lateral position and size of the emerging workpiece, means actuated by said control means for effecting operation of said feeding means to adjust one or both of said discs axially, a second control device co-acting with the workpieces immediately after they have passed said first control means and responsive to oversize of workpieces to co-operate with said first mentioned control means to actuate the feeding means for one or both of said grinding discs depending upon whether said first control means indicates the need for such adjustment by one or both of said discs.

4. In a disc grinder having annularly opposed grinding discs, each having means for feeding one toward and from the other, control means at both sides of a workpiece and responsive to the position of the work surface while part of said surface is still being ground, said means serving to determine whether one or both sides of a workpiece is in proper alignment and thus whether the discs are properly spaced and positioned, means actuated by said control means for effecting operation of said feeding means to adjust one or both of said discs axially, a second control element co-acting with a workpiece for detecting oversized workpieces and positioned so that a workpiece will pass therethrough only after said workpiece has emerged completely from between the grinding discs, means actuated by the second control element for completing a circuit to one or both of said feed actuating control means after said workpiece is clear of the grinding discs.

5. In a disc grinder having annularly opposed grinding discs, means for rotatably supporting said discs, said disc supporting means being slidably mounted on a bed member, each having means for feeding said discs toward and from one another, means for actuating the feeding means for each of said supporting members to compensate for wear on the grinding discs and thereby maintain a fixed space between said discs, means for controlling said feeding means comprising sensing devices directed to the opposite sides of a workpiece near the point where it emerges from the grinding discs, and means to delay the operation of said feeding means by said sensing devices comprising another sensing device positioned to respond to a workpiece after it has passed said first sensing device and emerged completely from the grinding discs comprising parallel contacts adapted to be actuated by said first sensing device, and connections from each of said contacts through a contact actuated by said other contact to complete a circuit through one or both of said first mentioned contacts.

References Cited in the file of this patent

UNITED STATES PATENTS

2,690,034	Laverdisse	Sept. 28, 1954
2,774,196	Laverdisse	Dec. 18, 1956