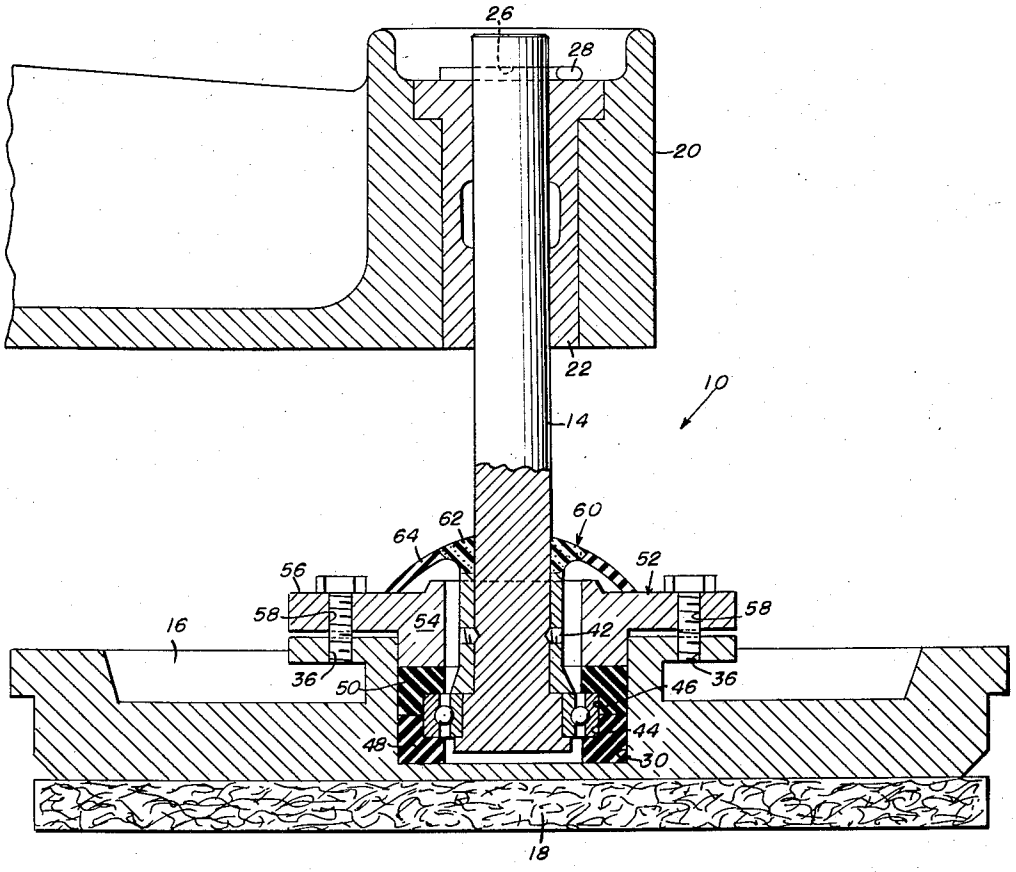
April 28, 1959 D. R. LIMBERS 2,883,805

POLISHER BLOCK SWIVEL JOINT

Filed Feb. 24, 1958



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United States Patent Office 2,883,805 Patented Apr. 28, 1959

2,883,805

POLISHER BLOCK SWIVEL JOINT

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Application February 24, 1958, Serial No. 716,977

6 Claims. (Cl. 51—168)

This invention relates to apparatus for surfacing plate glass or other flat glass sheets and more particularly to a novel means for connecting a polishing runner block to a spindle of a surfacing apparatus.

Conventional surfacing apparatus includes a rotary drive spindle and a plurality of radial arms extending from a hub connected to the spindle. Each arm is rigidly connected, by means of a vertical spindle, to a runner block to which is attached a polishing pad for contact with the glass. Each of the runner blocks is retained in a horizontal plane regardless of the surface conditions of the glass resulting in non-uniform surfacing of the glass and non-uniform wear on the pads. This invention avoids the deficiency set forth by providing a flexible connection between the runner block and the vertical spindle extending from the arm allowing misalignment therebetween to accommodate slight differences in surface conditions of the glass and thereby insuring substantially uniform polishing of the glass and wear of the polishing pad.

The primary object of this invention is the provision of an improved glass surfacing apparatus wherein the runner blocks are connected to a vertical spindle of the surfacing apparatus by flexible means to allow misalignment of the runner blocks to accommodate slight variations in the surface conditions of the glass.

This and other objects and features of this invention will be apparent when taken with the accompanying drawing wherein the single figure is a sectional view of part of a surfacing apparatus illustrating one of the plurality of runner blocks and having a polishing pad connected to a spindle by the flexible means.

Since all runner blocks and connections are the same, the description will be limited to the single one illustrated.

In the drawing, there is illustrated a part of the polishing apparatus, generally identified as **10**, including a spider arm **12**, a vertical spindle **14** and a polishing runner block **16** having a fibrous polishing pad **18**, such as felt, cemented thereto.

The arm **12** has an enlarged, substantially cylindrical, terminal end defining a bearing **20** to receive a flanged cylindrical bushing **22**. The spindle **14** is received within the bushing **22** and extends vertically downwardly, terminating in an enlarged, stepped end **24**. The top end of the spindle **14** is provided with an opening **26** to receive a pin **28** which retains the spindle in its illustrated position.

The runner block **16** is circular in outline and is provided with a central circular recess **30** having an outwardly flanged defining wall **32**, the flange **34** of which is provided with a plurality of openings **36** for a purpose to be described.

The spindle **14** at its end **24** is surrounded by a conventional ball bearing **38** which, because of its conventional construction, requires no further description. The ball bearing is locked in position by means of a lock collar **40** surrounding the spindle **14** and connected thereto by means of set screws **42**. The ball bearing is received within annular, complementary grooves **44** and **46** in

abutting flexible or resilient annular elements **48** and **50**, respectively. The elements **48** and **50**, preferably made of grease resisting synthetic rubber, are of the same external diameter as the diameter of the recess **30** and are received therein. A flanged retainer member **52** has a cylindrical portion **54** also received within the recess **30** and a flanged portion **56** provided with a plurality of openings **58** in alignment with the openings **36** in the flange **34**. When bolted together with the bolts passing through the aligned openings **36** and **58**, the retainer portion **54** retains the elements **48** and **50** in their illustrated positions and, therefore, provides the flexible connection between the spindle **14** and the runner block **16**.

A dirt seal **60** is provided to prevent the entrance of dirt or other foreign matter into the ball bearings **38** and comprises a substantially cup-shaped member surrounding the spindle **14** and having a relatively soft oil and grease resistant rubber portion **62** joined to a relatively hard rubber rim portion **64**, the latter being in contact with the retainer member **52** during the entire operation of the apparatus, the different rubber portions insuring this contact regardless of the relative misalignment between the spindle **14** and the runner block **16**. The choice of a grease resistant rubber for the portion **62** is dictated by the desire for long life to this portion, since the ball bearings **38** require greasing for efficient operation.

As will be obvious from the construction described, the spindle **14** will remain vertical under all conditions of operation, but the runner block **16** and pad **18** may become misaligned, i.e., may move from the horizontal position illustrated, due to the surface conditions of the glass being polished, this misalignment being allowed by the flexible connection between the block **16** and the spindle **14** provided by the members **48** and **50**.

I claim:

1. In a glass surfacing apparatus which includes a spider having a plurality of radial arms, a vertical spindle connected to each arm, and a plurality of runner blocks having attached surfacing means, the improvement comprising bearing means connected to each spindle adjacent its terminal end removed from the arm, a substantially circular central recess in each runner block, and substantially cylindrical resilient means having groove means embracing said bearing means, said resilient means being received within said recess and providing a flexible connection between each of said runner blocks and their respective spindles to allow relative misalignment therebetween when required by the surface of the glass.

2. In a glass surfacing apparatus which includes a spider having a plurality of radial arms, a vertical spindle connected to each arm, and a plurality of runner blocks having attached surfacing means, the improvement comprising bearing means connected to each spindle adjacent its terminal end removed from the arm, a substantially circular recess in each runner block, resilient means comprising a pair of abutting annular members each having a complementary groove therein embracing said bearing means, said resilient means being received within said recess and providing a flexible connection between each of said runner blocks and their respective spindles to allow relative misalignment therebetween when required by the surface of the glass, and means for retaining said annular members within said recess.

3. Glass surfacing apparatus comprising a spider having a plurality of radial arms, a vertical spindle connected to each arm, a plurality of runner blocks having attached surfacing means, ball bearing surrounding each spindle adjacent its terminal end removed from the arm, means fixing each ball bearing in position, a substantially circular central recess in each runner block, and resilient means including a pair of abutting annular rubber elements having complementary grooves therein embracing

said bearing means, said resilient means being received within said recess and providing a flexible connection between each of said runner blocks and their respective spindles to allow relative misalignment therebetween when required by the surface of the glass, and means for retaining said resilient means within said recess.

4. Glass surfacing apparatus as recited in claim 3, further including a dirt seal having a relatively flexible portion and a relatively rigid portion, said dirt seal being so constructed and arranged relative to said spindle and said runner block to prevent the entrance of dirt into said ball bearing in any relative position of said runner and spindle.

5. Glass surfacing apparatus as recited in claim 4,

wherein said dirt seal is substantially cup-shaped, said relatively flexible portion surrounds said spindle, and said relatively rigid portion is in continuous contact with said retaining member.

6. Glass surfacing apparatus as recited in claim 5, wherein said relatively flexible portion is soft rubber and said relatively rigid portion is hard rubber.

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