

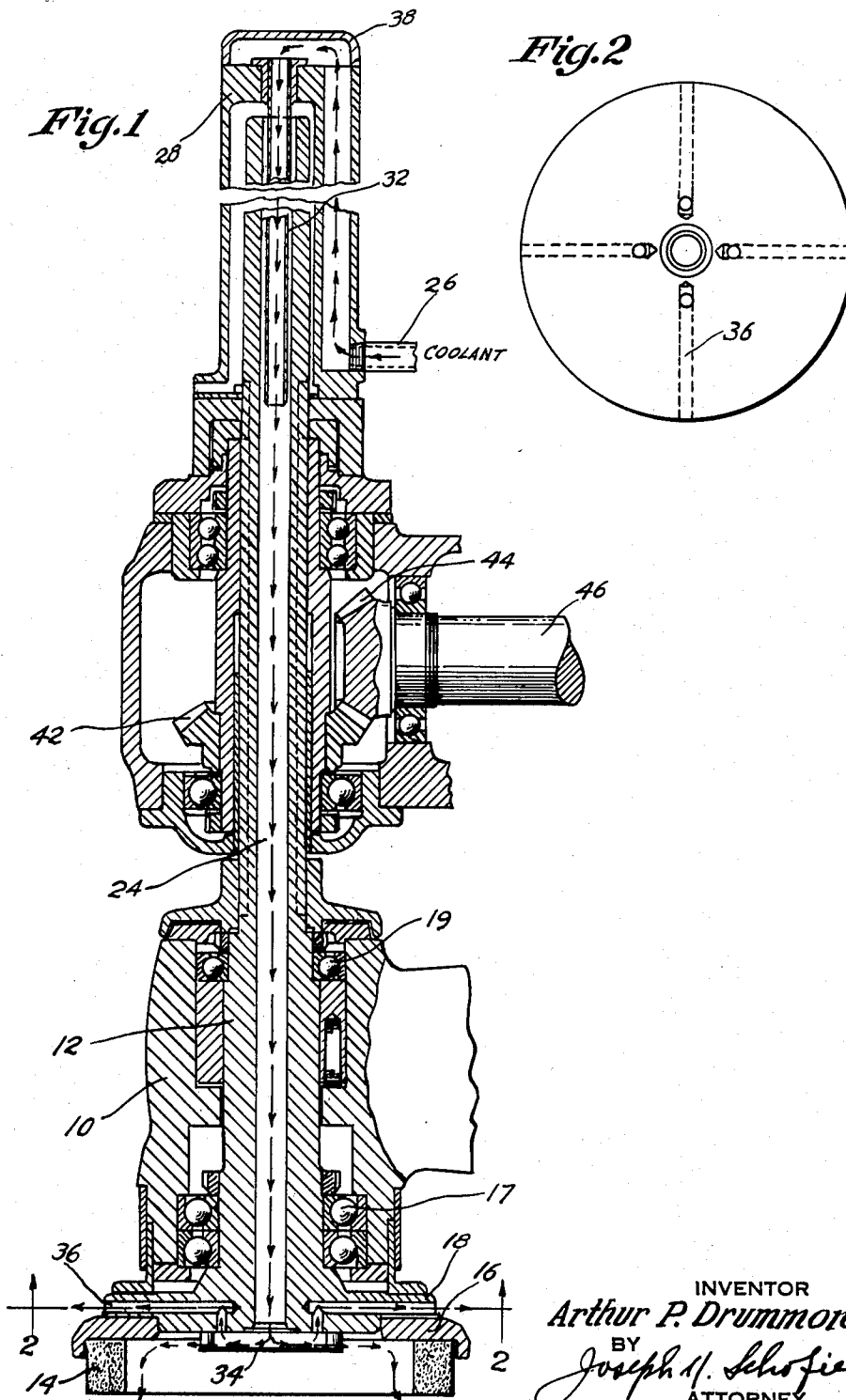
Feb. 7, 1956

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2,733,562

WHEEL SPINDLE FOR GRINDING MACHINES

Filed July 6, 1953



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## WHEEL SPINDLE FOR GRINDING MACHINES

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Application July 6, 1953, Serial No. 366,352

4 Claims. (Cl. 51-267)

This invention relates to grinding machines and more particularly to a wheel head construction for a vertical surface grinding machine in which provision is made for admitting a coolant fluid centrally thereof.

A primary object of the invention is to provide means for exhausting the coolant, such as water or other fluid, from the interior of an annular or ring type wheel used on this type of grinding machine and mounted at the lower end of the spindle.

Another object of the invention is to provide coolant exhausting channels or passages through the lower end of the wheel head on the spindle so that when a quantity of coolant builds up within the space within the wheel and above the work it may be exhausted by centrifugal action during rotation of the spindle through radially extending passages formed within the lower end of the spindle.

With the above and other objects in view, the invention may include the features of construction and operation set forth in the following specification and illustrated in the accompanying drawing.

In the accompanying drawing annexed hereto and forming a part of this specification, the invention has been shown embodied in a conventional vertical grinding head and spindle for a surface grinding machine, but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to this specification being relied upon for that purpose.

In the drawing:

Figure 1 is a central vertical section of a grinding machine wheel spindle and attached parts showing portions of a wheel head and wheel for a surface grinding machine to which the invention has been applied.

Fig. 2 is a bottom plan view of a portion of the mechanism shown on the plane of line 2-2 in Fig. 1.

In the above mentioned drawing there has been shown but one embodiment of the invention which is now deemed preferable, but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

Referring more in detail to the figures of the drawing, it will be seen that a wheel head 10 of conventional form is provided with a vertically extending spindle 12. At the lower end of this spindle is mounted a suitable ring or annular type grinding wheel 14. As shown in Fig. 1, the ring wheel 14 is attached fixedly to a metal plate 16 forming a wheel mounting detachably fastened in any preferred manner to an integral flange 18 formed at the lower end of the spindle 12. This spindle 12 is rotatably mounted within the head 10 upon suitable anti-friction bearings, there being a pair 17 shown near the lower end of the spindle and a single row bearing 19 adjacent its upper end. Rotation for the spindle 12 may be provided by a driving shaft 46, a portion only of which is shown connected to an intermediate portion of the spindle.

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In grinding machines of this type it is usual to supply a coolant to the cutting surface of the grinding wheel 14 through a passage 24 extending centrally through the spindle 12 from a connection 26 near the upper end of the spindle 12. As shown in Fig. 1, the connection 26 is attached to a sleeve 28 fitting over the upper end of the spindle. The sleeve 28 is closed at its upper end by a cap member 38. Fluid admitted from the connection 26 passes upward through the sleeve 28 and enters the upper end of a tube 32 which extends within the central opening within the spindle 12. The fluid may then flow downward through the spindle 12 and from the lower end thereof into the space within the wheel. The lower end of the passage 24 has a baffle plate 34 spaced a short distance from the lower end surface of the spindle 12 so that the coolant will be deflected radially within the space within the wheel 14 to contact the work being operated on. Fluid first, however, contacts the inner surface of the wheel to aid in cooling it.

In many instances where the wheel is constantly in contact with the work piece, as when there is no overrun of the work by the wheel at the opposite ends of the stroke of the table or head relative to the work and particularly when the wheel has worn a considerable amount, there is a tendency for the coolant to build up within the space within the wheel 14. This excessive supply of fluid causes the coolant to back up into the operative parts of the spindle to cause damage to the bearings and other parts of the head. This fluid may also overflow and flood the wheel head and other parts of the grinding machine.

It has therefore been found advisable to provide some definite continuously open channel to prevent this build-up of coolant within this space within the wheel 14. For that purpose passages 36, four of which are shown, are provided within the flange 18 on the spindle 12. The inner ends of these passages 36 extend axially downward a short distance, their lower ends entering the space within the wheel 14 and above the baffle plate 34. The upper ends of these short vertical passages intercept the radial portions of the passages extending to the outer surface of the flange 18. It will be seen, therefore, that with the rotation of the spindle 12 the coolant, whenever it accumulates in substantial quantities within the space within the wheel 14, will be exhausted by centrifugal action through the radially extending passages 36 through the flange 18. The passages 36 are always open but so long as the coolant can flow into the space within the wheel 14 the coolant will not enter these passages.

The rotating means for the spindle 12 may be as shown by means of a pair of intermeshing bevel gears 42 and 44. Gear 42 engages within splines formed in the spindle 12 and gear 44 is mounted on the inner end of driven shaft 46.

I claim as my invention:

1. A wheel head for grinding machines having a spindle rotatably mounted therein, means to supply coolant through said spindle, a flange formed on the lower end of said spindle, an annular wheel attached to said flange for rotation with said spindle, said flange having passages extending therein, one end of said passages depending downward and entering the space within said wheel, and said passages extending radially to the outer surface of said flange.

2. A wheel head for grinding machines having a spindle rotatably mounted therein, means to supply coolant through said spindle, an integral flange formed on the lower end of said spindle, an annular wheel detachably attached to said flange for rotation with said spindle, said flange having passages extending therein, the inner ends of said passages extending axially downward and entering the space within said wheel, and said passages ex-

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tending radially and having their outer ends extending to the outer surface of said flange.

3. A wheel head for grinding machines having a spindle rotatably mounted therein, an integral flange formed on the lower end of said spindle, a disc detachably attached to said flange, an annular wheel attached to said disc for rotation with said spindle, said flange having passages extending therein, one end of said passages extending downward and entering the space within said wheel, said passages extending radially to the outer surface of said flange, and means to admit coolant through said spindle to the space within the wheel.

4. A wheel head for grinding machines having a spindle rotatably mounted therein, a flange formed on the lower end of said spindle, an annular wheel attached to

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said flange for rotation with said spindle, said flange having passages extending therein, the inner end of said passages depending downward and entering the space within said wheel, said passages extending radially to the outer surface of said flange, a baffle plate spaced from the lower end of the spindle, and means to admit coolant through said spindle and past said baffle plate to the space within the wheel.

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