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COOLANT SPLASH SHIELD AND SUPPORT

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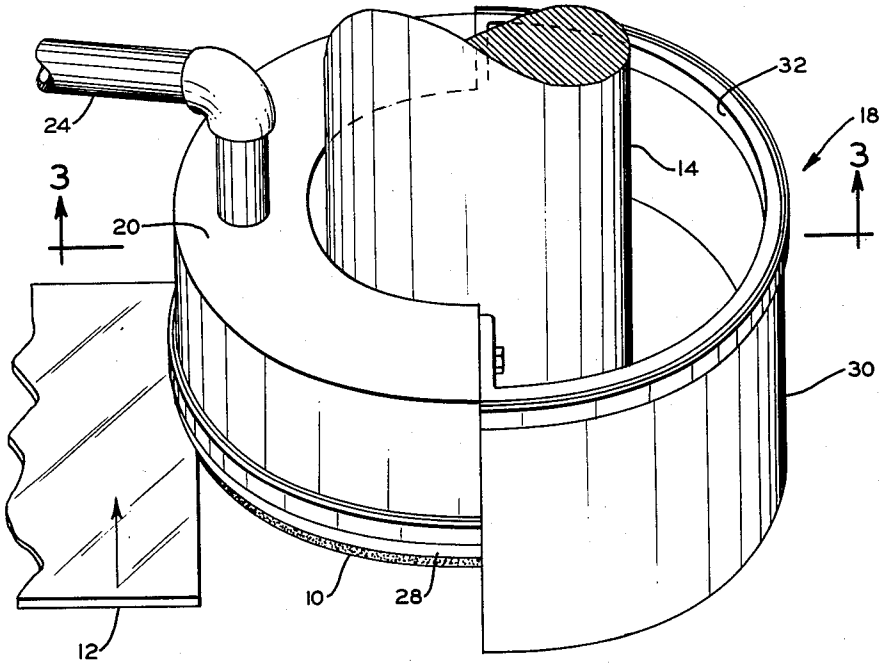

FIG. 1.

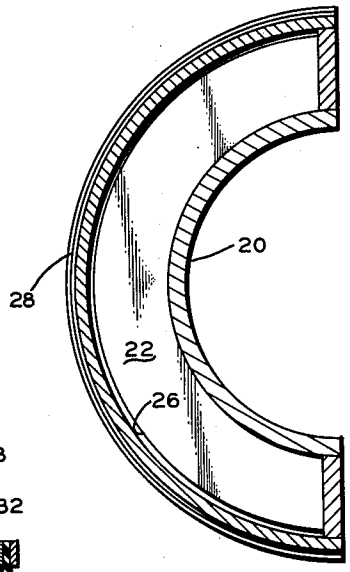

FIG. 4.

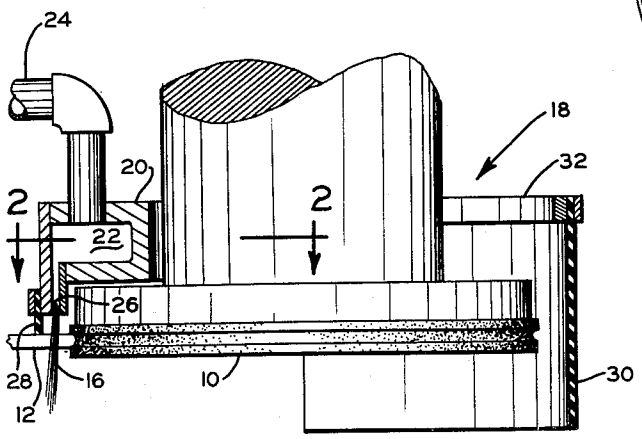

FIG. 3.

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COOLANT SPLASH SHIELD AND SUPPORT

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This invention is concerned with a device for confining liquid spray in a machine tool, and more particularly to a coolant splash shield for a glass edge grinding machine. The coolant splash shield for the present invention is especially useful with an edge grinding wheel that is mounted on the end of a vertically extending shaft for rotation in a horizontal plane.

In the past it was customary to utilize a series of brushes to contain the coolant spray in the area adjacent the glass edge grinding wheel. These brushes were spaced from the edge of the grinding wheel and extended along one-half the periphery thereof. The coolant was directed along the path generally tangential to the grinding wheel into the brushes, and as a glass sheet moved into contact with the wheel the coolant was deflected by the glass into engagement with the periphery of the wheel. As the brushes became worn the coolant had a tendency to move through the brushes requiring considerable screening around the grinding machine to protect the operator. Also when the liquid coolant was directed against the periphery of the wheel by the glass, the coolant was atomized and thrown through brushes by centrifugal force thereby losing its effectiveness.

The problems arising from the coolant splash shields of the prior art are solved by the structure of the present invention which provides a continuous curtain of coolant adjacent and spaced from one-half of the peripheral surface of the grinding wheel. The coolant curtain does not touch the grinding wheel except during the grinding operation when the glass deflects a portion of the curtain into engagement with the wheel. Flexible shields are mounted outwardly of the curtain to catch any coolant that is propelled outwardly by centrifugal force as the glass engages the grinding wheel.

It is, therefore, an object of the present invention to provide a coolant splash shield that is inexpensively manufactured and eliminates the necessity for auxiliary splash guards on the machine tool.

A further object of the invention is to provide a coolant splash shield which effectively contains the coolant in the grinding machine thereby eliminating the necessity for the operator to wear waterproof protective clothing.

Further object of the invention is to provide apparatus for supplying a liquid coolant to a grinding wheel which contains the coolant in the vicinity of the wheel and prolongs its life.

A still further object of the invention is to provide an improved coolant splash shield which reduces edge chipping during the grinding operation thereby achieving an improved finished product.

Other objects of the invention will be apparent from the description which follows and from the drawings in which like numbers are used throughout to identify like parts.

In the drawings:

FIG. 1 is a perspective view of the apparatus of the invention mounted adjacent a glass edge grinding wheel;

FIG. 2 is a horizontal section taken along the line 2—2 in FIG. 1; and

FIG. 3 is a vertical section taken along the line 3—3 in FIG. 1.

The above stated objects are achieved by an improved coolant splash shield which comprises a curved member which is mounted above the grinding wheel and has a

semi-circular slot therein spaced outwardly of one-half the peripheral edge of the grinding wheel. Coolant is fed through the slot to form a continuous curtain adjacent this half of the grinding wheel, and the coolant curtain does not touch the wheel except during the grinding operation when the glass deflects the curtain into engagement with the wheel. Fexible shields encircle the wheel to contain the coolant.

Referring now to the drawings, there is shown a typical grinding wheel 10 having a circular configuration and a groove in the peripheral surface thereof for finishing the edge of a glass sheet 12. The grinding wheel 10 is mounted on the end of a vertically extending shaft 14 which rotates at high speed, and the shaft is of the type utilized in the grinding machine shown in United States Patent No. 2,579,337. The grinding wheel 10 rotates at high speed in a horizontal plane, and it is necessary to provide a liquid coolant to its peripheral edge during the grinding operation.

According to the invention the stream of coolant is supplied radially outward from the periphery of the wheel 10 in the form of a solid wall or curtain 16 which does not normally contact the wheel except during the grinding operation when it is deflected thereagainst by the glass sheet 12. Thus the coolant does not tend to erode the wheel 10 when the glass is not being ground. Means are provided for containing the coolant that is thrown from the edge of the wheel 10 in the vicinity of the grinding wheel.

The structure of the invention includes a coolant splash guard 18 that is positioned above the grinding wheel 10 as shown in FIGS. 1 and 3. The coolant guard 18 comprises a curved member 20 that has a generally C shaped configuration and is mounted circumjacent a portion of the shaft 14. As shown in FIGS. 2 and 3 a semi-circular chamber 22 within the curved member 20 forms a coolant header that is in communication with a suitable supply through a line 24. The coolant flows from the chamber 22 through a continuous, semi-circular slot 26 in the bottom thereof, and because this slot is continuous the coolant flows therethrough to form the solid wall or curtain 16. The slot 26 is located not only above the grinding wheel 10 but also radially outward therefrom so that the coolant curtain 16 does not contact the periphery of the wheel. As the glass sheet 12 is moved toward the grinding wheel 10, a portion of the coolant curtain 16 is deflected into engagement with the periphery of the wheel 10.

A portion of this deflected coolant is thrown outwardly from the peripheral surface of the grinding wheel 10 by centrifugal force. The coolant guard 18 also comprises a generally semi-circular, flexible shield 28 which is mounted on the lowermost portion of the outer peripheral surface of the member 20, and a semi-circular, flexible shield 30. The flexible shield 28 extends downwardly a predetermined distance to the central portion of the periphery of the wheel 10 so that when the glass sheet 12 engages the wheel 10 the area between the glass and the shield 28 is closed to contain the coolant spray.

The opposite or rear side of the grinding wheel 10 is covered by the second flexible shield 30 that depends downwardly from a semi-circular arm 32 having both ends secured to opposed ends of the member 20 as shown in FIG. 3. The flexible shield 30 is substantially longer than the shield 28 and extends downwardly beyond the plane of the lower surface of the grinding wheel 10.

While the preferred embodiment of the invention has been shown and described, it will be appreciated that various modifications can be made to this structure without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In combination with a grinding wheel mounted on the end of a vertically extending shaft for rotation in a generally horizontal plane, a curved member mounted above said grinding wheel circumjacent a portion of said shaft, said member being stationary with respect to said shaft, a chamber formed within said member, means for supplying a fluid coolant to said chamber, said member having a continuous opening extending along the bottom thereof forming an exit from said chamber, said opening being spaced upwardly and outwardly from the periphery of said grinding wheel whereby said coolant flows from said chamber in the form of a curtain spaced outwardly from said grinding wheel, a first flexible shield mounted on said member outwardly from said opening, said first flexible shield depending downwardly from said member a predetermined distance to the central portion of the periphery of said grinding wheel and extending around substantially one half of said periphery, and a second flexible shield mounted adjacent said first flexible shield and extending downwardly beyond said grinding wheel about the remaining half of said periphery.

2. In combination with a grinding wheel mounted on the end of a vertically extending shaft for rotation in a generally horizontal plane, a curved member mounted above said grinding wheel circumjacent a portion of said shaft, a semi-circular chamber formed within said curved member, means for supplying a liquid coolant to said chamber, said curved member having a continuous opening extending along the bottom thereof forming an exit from said chamber, said opening being spaced upwardly and outwardly from the periphery of said grinding wheel whereby said liquid coolant flows from said chamber in the form of a curtain spaced outwardly from said grinding wheel, a first flexible shield spaced outwardly from said curtain, said first flexible shield depending downwardly to the central portion of the periphery of said grinding wheel and extending around substantially one half of said periphery, a curved arm mounted above said grinding wheel circumjacent the remaining portion of said shaft, said curved arm having opposite ends secured to opposed ends of said curved member, and a second flexible shield mounted on said curved arm and depending downwardly therefrom beyond said grinding wheel about the remaining half of said periphery.

3. Apparatus for supplying a liquid coolant to a grinding wheel and containing said coolant in the vicinity of said wheel, said apparatus comprising a curved member having a coolant chamber formed therein and being stationary with respect to said grinding wheel, said member having a continuous opening therein forming an exit from said coolant chamber whereby said liquid coolant flows from said coolant chamber in the form of a liquid curtain, a first flexible shield depending a predetermined distance from said curved member outwardly from said opening and extending in a semi-circle, a curved arm having opposite ends secured to opposed ends of said curved member, and a second flexible shield depending from said curved arm a distance greater than said predetermined distance and extending in a semi-circle whereby said grinding wheel is encircled by said first and second flexible shields.

References Cited in the file of this patent

UNITED STATES PATENTS

436,892	Harrington	Sept. 23, 1890
1,100,845	Richter	June 23, 1914
2,738,625	Strnad	Mar. 20, 1956

FOREIGN PATENTS

696,198	Great Britain	Aug. 26, 1953