March 3, 1931. F. E. STRATTON 1,794,992

SEGMENT FOR USE IN GRINDING WHEELS

Filed April 2, 1929

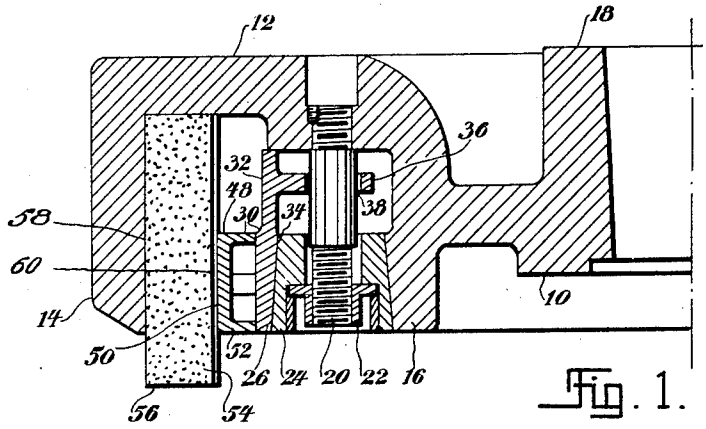


Fig. 1.

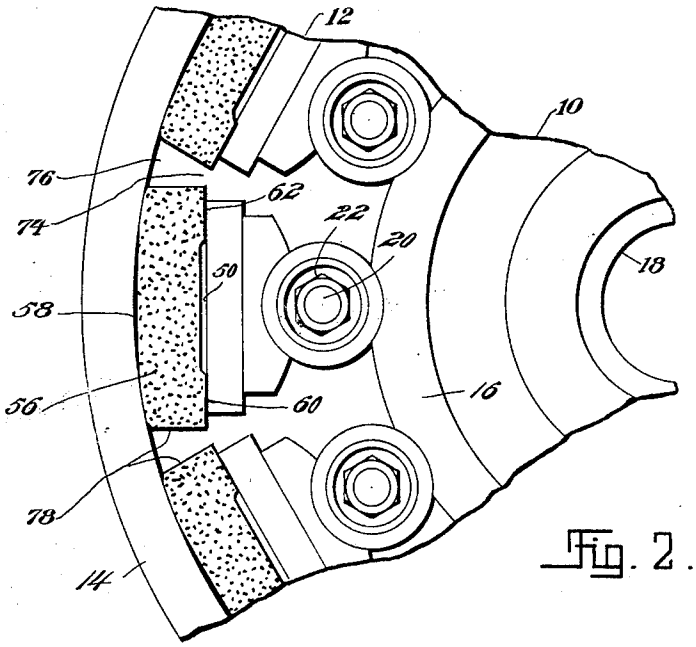


Fig. 2.

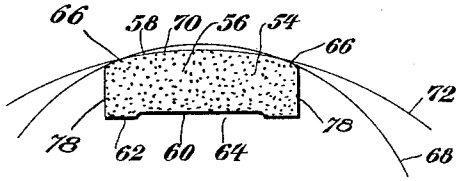


Fig. 3.

INVENTOR

BY Frank E. Stratton

Thomas A. Jenckes Jr.

ATTORNEY

Patented Mar. 3, 1931

1,794,992

UNITED STATES PATENT OFFICE

FRANK E. STRATTON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO DIAMOND MACHINE COMPANY, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND

SEGMENT FOR USE IN GRINDING WHEELS

Application filed April 2, 1929. Serial No. 352,017.

My invention, relates to grinding wheels particularly of the type made up of a plurality of abrasive segments supported in a chuck to form a plane grinding surface and also to a novel type of an abrasive grinding segment. One type of grinding wheel known as a ring or cylinder wheel consists of a metal chuck which has abrasive segments held between a depending annular flange preferably an outer flange and clamping or wedge members to wedgedly retain the segments in position against the annular flange.

An object of my invention is to provide a novel type of segmental grinding wheel for this purpose, and an improved segment for use therein, which segments are of a standardized form which may be readily shaped out of abrasive material in quantity and which are so shaped that they may be interchangeable in different size chucks thereby obviating in accordance with modern methods of standardization, the necessity for the production of different shaped segments for different sized chucks.

A further object of my invention is to further standardize the manufacture of segments of this description by constructing them of a shape easy to mold or manufacture and of a greater inherent strength than hitherto. In practice normally an annular outer flange projects downwardly from the grinding wheel chuck and as stated, different size chucks having flanges of different degrees of curvature are interchangeably employed. In order that my improved segment may be shaped say for use on a 36″ chuck to a 30″ chuck, I preferably construct the exterior portions of the outer side thereof of a curvature adapted to contact and abut for a continuous distance a flange of a chuck of a relatively small diameter and interior portions of the outer side thereof near the radial center thereof of a degree of curvature adapted to contact and abut a chuck having a depending annular flange of a relatively larger degree of curvature. In order that the clamping blocks or members which normally have an exterior flat surface as shown in Patents Nos. 1,461,514, issued July 10, 1913 to James A. Burns for Grinding machine and 1,526,953, issued February 17, 1925 to Hugo W. Beth for Segmental grinding machine, may be used, I preferably construct at least a portion of the inner side of the segments flat so that they may flatly abut the outer sides of the chuck members. In order that pressure will not be exerted on the center of the segments and will be exerted at points near the exterior ends thereof substantially radially opposite the points of contact of said segments against said annular flange, I preferably cut away the center portions of the inner sides of said segments and for ease of manufacture I preferably construct the end walls of each segment perpendicular to the base lines or flat inner sides thereof.

A further problem inherent in the use of segmental grinding wheels of this description lies in removing the detritus from the center of the grinding wheel and properly cooling the grinding segments. I therefore construct the segments of such a length and locate them in such a manner in the chuck that they are spaced from each other to provide radial passages for the discharge of detritus and cooling spaces between the ends of each segment which as the end walls of each segment are perpendicular to the base thereof preferably diverge outwardly to provide larger cooling spaces and freer passages for the radial discharge of detritus from the center of the grinding wheel.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of the accompanying drawings, which illustrate an embodiment thereof.

In the drawings, Fig. 1 is a fragmentary sectional view of a portion of a chuck carrying my abrasive segments showing how the segments are usually fastened in place.

Fig. 2 is a fragmentary front elevation of said chuck carrying my abrasive segments.

Fig. 3 is a diagrammatic view illustrating how different portions of the outer side of a segment contact the inner peripheries of the annular flanges of different size chucks.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 generally indicates a type of chuck suit-

able for carrying my improved segments. Said chuck is preferably constructed in accordance with the showing of the chuck in Patents Nos. 1,461,514 and 1,526,953. Said chuck consists of an annular body member 10 having a rim 12 having a pair of spaced depending annular flanges 14 and 16, both flanges being part of the member 10. The member 10 is provided with a suitable hub 18. The inner rim 16 is provided with the chuck members which include a plurality of clamping bolts or studs 20 adapted to have the adjusting nuts 22 mounted on the lower ends thereof. Sleeves 24 having tapered outer surfaces 26 and counter bores are placed on the studs 20 to engage the clamping blocks 30. Said clamping blocks 30 comprise the inner members 32 having tapered cooperating inner surfaces 34 to engage the sleeves 24, the upper inwardly projecting flanges 36 having bores 38 therein adapted to surround the studs 20 and hold the members 32 in position and the outer block members 48 having at outer sides 50 adapted to abut a segment and inwardly projecting portions 52 adapted to abut the outer surface of the inner members 32.

The chuck construction employed and shown herein is substantially similar to that heretofore referred to and my invention consists of a novel type of grinding segments for use in a chuck of this description and such a chuck having said segments mounted therein in a novel manner. The outer flange comprises the depending annular flange 14 and the segments 54 are adapted to be clamped by the clamping block 30 against the inner periphery of said flange 14.

I employ the abrasive segments 54 of suitable abrasive material such as carborundum or the like having a plane grinding surface 56 and the opposed sides 58 and 60 adapted to be clamped in the chuck. One side, preferably the inner side 60 thereof is provided with a flat surface 62 adapted to be engaged by a clamping member such as the outer surface of the clamping block 30 and preferably has its center portion cut away as at 64 so as to permit the segment to contact the block 48 at the outer portions thereof only and another side preferably the outer side 58 curved so as to contact a chuck flange. I preferably as shown in Fig. 3 construct the exterior portions 66 of said outer side 58 of a relatively small degree of curvature to contact a chuck flange 68 of relatively small diameter say, 30″ as shown diagrammatically in Fig. 3 and interior portions 70 of a relatively larger degree of curvature to contact a chuck flange 72 of relatively larger diameter say 36″ as also diagrammatically illustrated in Fig. 3. It is therefore obvious that as the exterior portions 62 of the inner wall 60 abut the clamping members 48 only that the pressure will be exerted on the inner periphery of the annular flange 14 from the exterior ends of the segments only thereby preventing the segments from buckling in the center.

I preferably construct each segment 56 of such a length and space the clamping members 30 at such a distance from one another in the chuck that radial passages 74 for the discharge of detritus radially outwards from the chuck are provided, said radial passages 74 preferably diverging outwardly as at 76 to provide greater cooling spaces for the grinding surface between each segment. For ease of manufacture and to permit the divergence of the passages 74 near the outer ends thereof, I preferably construct the end walls 78 of each individual segment perpendicular to the bases or inner sides 60 of each segment. It is thus apparent that as the end walls 78 project perpendicularly upwardly from the bases 60, that said segments 54 are relatively easy to construct and may be readily moulded in large quantities.

It is thus obvious that I have provided a novel type of segment so constructed that it is adapted to be interchangeable for use in chucks of different diameters its interchangeability depending on the number of surfaces of different degrees of curvature employed, one which is relatively strong and relatively easy to manufacture and one which when employed in a chuck provides free passages for the discharge of detritus from the grinding wheel and suitable cooling spaces between the ends of each segment.

It is understood that my invention is not limited to the specific embodiment shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim is:

1. An abrasive segment having a plane grinding face and opposed sides adapted to be clamped in a chuck, the inner side thereof having a flat surface adapted to be engaged by a clamping member and having a central cut away portion and a curved outer side, exterior portions thereof being of a curvature to compactly abut for a substantial distance, an inner chuck flange wall of a relatively small diameter and interior portions thereof being of a curvature to abut for a substantial distance a chuck flange wall of a relatively larger diameter and side walls extending perpendicularly upwardly from said inner side, whereby said segment may be compactly retained in a chuck of a relatively larger diameter or in a chuck of a smaller diameter.

2. An abrasive segment having a plane grinding face and opposed sides adapted to be clamped in a chuck, the inner side thereof being adapted to be engaged by a clamping member and a curved outer side, exterior portions thereof being of a curvature to abut for a substantial distance, an inner chuck flange wall of a relatively small diameter and inte-

rior portions thereof being of a curvature to abut for a substantial distance, an inner chuck flange wall of a relatively larger diameter, whereby said segment may be compactly retained in a chuck of a relatively larger diameter or in a chuck of a smaller diameter.

3. An interchangeable segment having a grinding face and opposed sides adapted to be clamped in a chuck, the inner side thereof being adapted to be engaged by a clamping member and the outer side thereof having portions of different degrees of curvature adapted to compactly engage for substantial distances inner chuck flange walls of different degrees of curvature.

4. An interchangeable segment having a grinding face and opposed sides adapted to be clamped in a chuck, one side thereof being adapted to be engaged by a clamping member and the other side thereof having portions of different degrees of curvature adapted to compactly engage for substantial distances chuck flange walls of different degrees of curvature.

FRANK E. STRATTON.