Aug. 9, 1938. T. J. McINTYRE 2,126,403

GRINDING WHEEL

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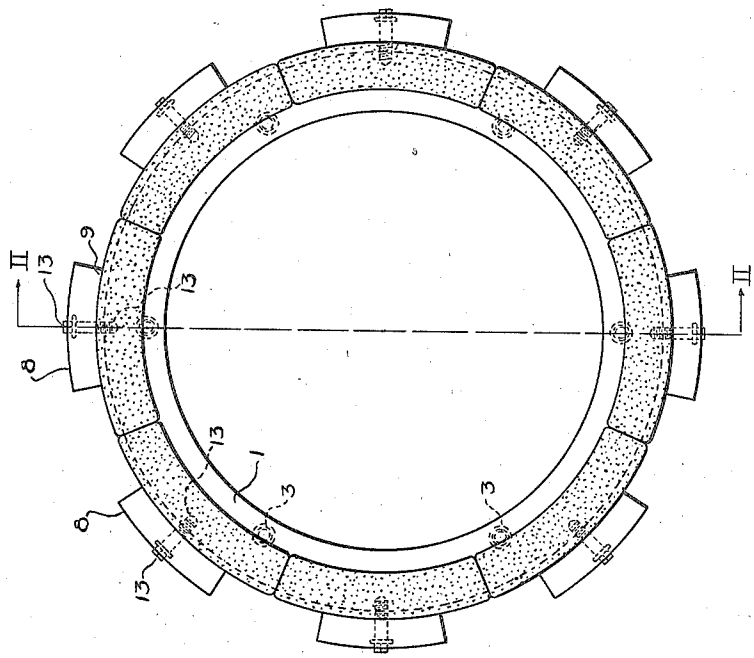

Fig. 1

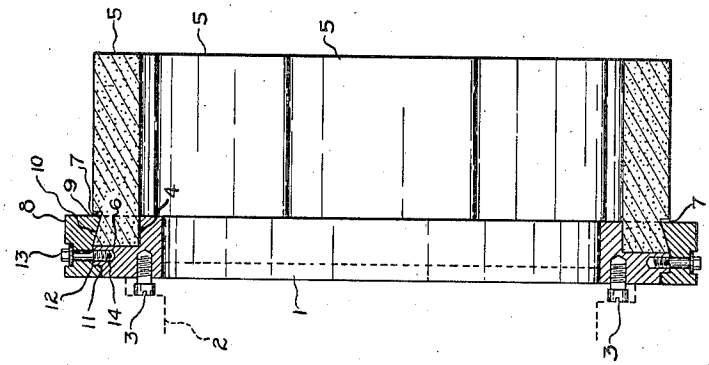

Fig. 2

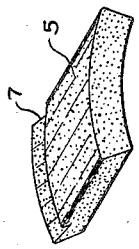

Fig. 3

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GRINDING WHEEL

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2 Claims. (Cl. 51—209)

This invention relates to grinding wheels and to chucks therefor, and particularly to chucks for cylindrical wheels supported from one end and having the face of the opposite end used for grinding.

The chuck according to the present invention is particularly adaptable for grinding wheels of segmental construction. Chucks for cylindrical grinding wheels should be designed so that they are light in weight and simple in construction. The abrasive members or segments should be quickly removable and replaceable and held firmly in place against accidental loosening. Furthermore, such chucks should have a minimum overhang or lateral projection along the outer face or surface of the abrasive members or segments so that a maximum percentage of the abrasive member or segment may be used. The present invention is an improvement over Patent No. 2,023,041 to Ballash.

An object of the invention is to provide a chuck embodying the above desiderata consisting of a base ring having a seat and a plurality of external shoes to clamp a grinding wheel in the seat.

Another object of the invention is to provide a chuck having a ring and a plurality of clamping shoes having inclined wedging clamping faces for coacting with tapered faces on the grinding wheel to positively lock the grinding wheel to the ring.

A still further object is to provide a new grinding wheel unit for use in the novel chuck.

These and other objects will be apparent from the following specification when taken with the accompanying drawing in which:

Fig. 1 is an end elevation of a cylindrical grinding wheel constructed of a plurality of segments supported by the chuck,

Fig. 2 is a section on the line II—II of Fig. 1, and

Fig. 3 is a perspective view of one of the grinding wheel segments.

Referring particularly to the drawing the base ring 1 is secured to a suitable, driven base 2, indicated in dotted outline, by the screws 3. An annular right angle exterior seat 4 in the ring 1, having one of its sides extending in the direction of the axis of the ring 1, forms a seat for receiving the grinding wheel or abrasive material segments 5. The other side of the seat is defined by a shoulder 6. The abrasive segments 5 are generally rectangular in axial cross-section but are provided at one end with a groove 7 having two sides, one side thereof being in a plane perpendicular to the axis of the ring 1 and the other preferably being inclined and concentric with the axis of the ring 1. The segments 5 are each clamped in the seat 4 as shown particularly in Fig. 2 by a shoe 8. The shoes 8 are each provided with a projection 9 having an inclined surface 10 corresponding to the inclined surface of the groove 7 for contacting and wedging engagement with the inclined surface of its respective groove 7. It will be apparent that the inclined surface of the groove 7 and that of the projection 9 may be flat rather than concentric with the ring 1. The shoes 8 also have shoulders 11 abutting against a shoulder 12 on the ring 1. Screws 13 extending through the shoes 8 into tapped bores 14 in the ring 1 are provided for drawing the shoes 8 against the segments 5. As the shoes 8 are drawn inwardly by the screws 13 the segments 5 are locked in the seat 4, the coacting inclined faces of the grooves 7 in the segments 5 and the projection 9 of the shoes 8 preventing outward movement, and the shoulder 6 of the ring 1 preventing inward movement of the segments 5. Furthermore, the shoulders 11 on the shoes 8 coacting with the shoulder 12 on the ring 1 prevent axial movement of the shoes 8 relative to the ring 1 in a direction to permit the accidental loosening of the segments 5.

It will be obvious that the chuck according to the present invention positively locks the segments 5 against the base ring 1 without the necessity of radial projections increasing the maximum thickness of the segments 5 and without overhanging the segments 5 more than a minimum distance thereby resulting in the use of a minimum amount of abrasive material for a maximum amount of wear. The present segment design also eliminates the necessity of transverse slots or other irregular segment outlines which make possible a greatly decreased manufacturing cost.

It will be obvious from the foregoing that the present construction provides an efficient abrasive device of extreme simplicity capable of inexpensive manufacture. While the invention is particularly desirable for segmental cylindrical grinding wheels it is contemplated that also it may be used for unitary cylindrical grinding wheels. Accordingly it is intended that the invention be limited only by the scope of the following claims.

I claim:

1. An abrasive device comprising a ring having an annular seat, one side thereof extending

axially of said ring, another side of said ring defining a shoulder, a plurality of grinding wheel segments disposed in the form of a cylinder in said seat, the ends thereof abutting against said shoulder, a portion of the inner sides thereof bearing against said first named side of said seat, a second shoulder defined by said ring axially spaced from said first named shoulder, an annularly extending groove in each segment adjacent said first named shoulder, a plurality of shoes one for each segment, each having a locking portion disposed in the groove of its respective segment, a second locking portion on each shoe disposed behind said second shoulder, and means to radially draw said shoes toward said ring to clamp and lock said segments in said seat, said second shoulder and second locking portions and first named locking portion cooperating to prevent said segments from axially moving out of said seat.

2. An abrasive device comprising a ring having an annular seat, a plurality of grinding wheel segments disposed in the form of a cylinder in said seat, said segments being axially slidable in said seat, a shoulder on said seat limiting axial movement of said segments on said seat in one direction, a plurality of shoes, one for each segment, means to draw said segments to said ring to clamp said segments in said seat, means including a portion of said shoes to prevent axial movement of said segments on said seat in the opposite direction, and a shoulder to prevent movement of said shoes axially of said ring in said opposite direction.

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