Aug. 13, 1957 A. BLOCK 2,802,315

MULTIPLE ABRASIVE GRINDING WHEEL ASSEMBLY

Filed Jan. 10, 1955 2 Sheets-Sheet 1

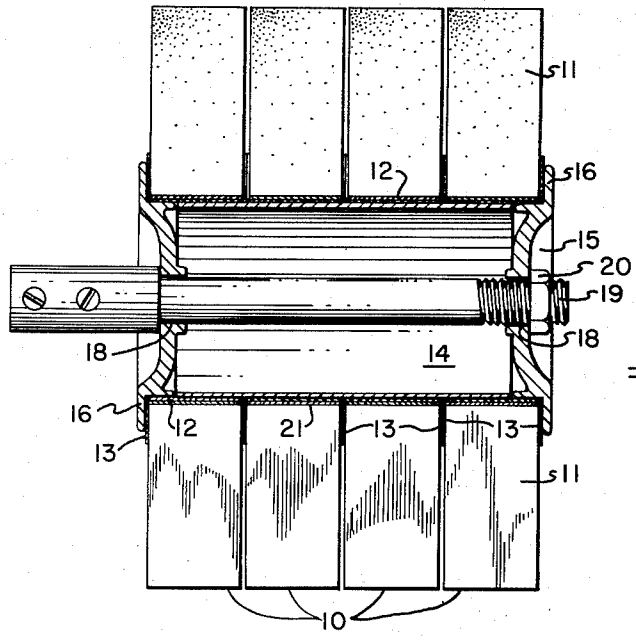


FIG. 1

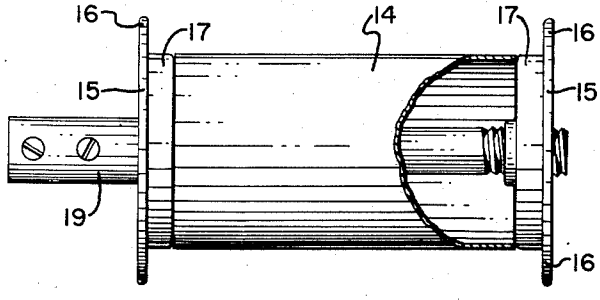


FIG. 2

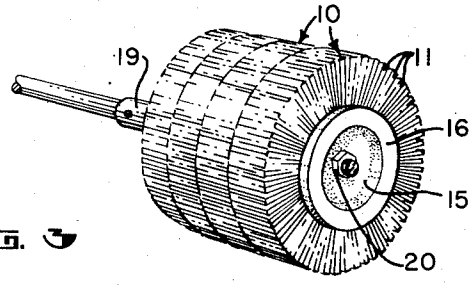


FIG. 3

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MULTIPLE ABRASIVE GRINDING WHEEL ASSEMBLY

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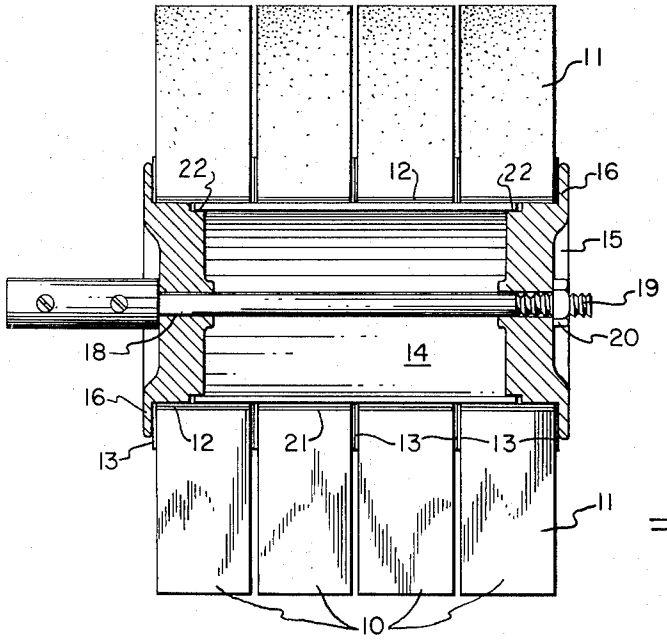


FIG. 4

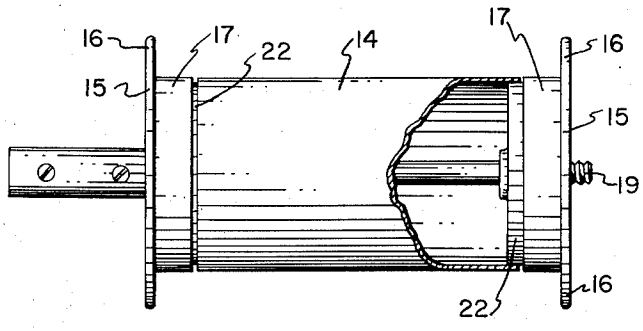


FIG. 5

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2,802,315

MULTIPLE ABRASIVE GRINDING WHEEL ASSEMBLY

Aleck Block, Culver City, Calif., assignor to Merit Products, Inc., Culver City, Calif., a corporation of California

Application January 10, 1955, Serial No. 480,889

4 Claims. (Cl. 51—193.5)

This invention relates to a multiple abrasive grinding wheel assembly.

It is an object of my invention to provide an assembly of a plurality of abrasive grinding wheels in order to grind an area which is wider than a single wheel. In the manufacture of abrasive, grinding and buffing wheels, including particularly the type comprising a plurality of abrasive coated leaves, it is not practical to make a wheel more than a few inches wide. It often occurs, however, that the area to be covered by the grinding operation is substantially wider than the wheel and that the use of the conventional wheel would be too slow and inefficient for practical commercial use.

The principal object of my invention is to provide an assembly whereby a plurality of conventional wheels may be held in a unitary assembly in a simple manner depending entirely on frictional engagement of the respective parts, thus making the assembly simple and making alteration of the wheels unnecessary.

In use, my assembly provides better results than could be obtained by the use of a single wide grinding wheel, even if such a wheel were available. With my assembly, for example, the width of the grinding area can be easily and quickly varied as desired during the progress of the work, yet only one width of wheel need be made by the manufacturer, stocked by the distributor, and bought by the purchaser. My assembly is more adaptable to grinding surfaces of varying contour, since the leaves of one wheel in the assembly can adjust themselves to one contour without affecting the disposition of the leaves of the other wheels. The same mounting means can also be used for one wheel or for any number of wheels, thus simplifying the cost of my assembly and the use of the same.

It is a further object of my invention to provide such a multiple abrasive grinding wheel assembly which is simple and economical to manufacture and simple and economical to use, thus benefiting both the manufacturer and the consumer.

My invention also comprises such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred embodiment of my invention, it should be understand that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings, Fig. 1 is a longitudinal sectional view of my multiple abrasive grinding wheel assembly;

Fig. 2 is a side elevational view of my assembly without the wheels mounted thereon and with the cylinder partly broken away at one end thereof;

Fig. 3 is a prespective view of my mutiple abrasive grinding wheel assembly ready for use;

Fig. 4 is a longitudinal sectional view of another embodiment of my mutiple abrasive grinding wheel assembly;

Fig. 5 is a side elevational view of the same embodiment of my device without the wheels mounted thereon and with the cylinder partly broken away at one end thereof.

A preferred embodiment which has been selected to illustrate my invention comprises an abrasive grinding wheel 10, which is formed of a plurality of leaves 11, having on one side thereof a suitable coating of abrasive material. The leaves 11 are adhered at their inner ends to a circular cardboard core 12. A pair of circular fibre strips 13 are disposed on the opposite sides of wheel 10 adjacent core 12 to further hold the leaves 11 in place.

A plurality of wheels 10, from two to as many as desired, may be mounted side by side on a single arbor. Being separate wheels, their leaves are free to move independently from each other.

An elongated cylinder 14, which is preferably formed of metal, extends through the cores 12 of the wheels to a point short of the ends of the outside wheels of the assembly. Where two wheels are used, the length of cylinder 14 is slightly less than the width of the two wheels. Where three wheels are used, the length of the cylinder 14 is slightly less than the width of three wheels, and so on.

A pair of substantially identical mounting plates 15 are mounted on opposite ends of the assembly. The plates 15 are preferably formed of metal and are provided with side portions 16 adjacent their outer circumferential edges, which overlie the fibre strips 13 of the outer wheels of the assembly. Each plate 15 has an inwardly directed flange 17, which extends at a right angle to the side portion 16. The flange 17 is circular and of slightly smaller diameter than the core 12 of wheels 10. Each plate 15 is provided with a centrally disposed opening 18, which extends through a thickened portion of the plate to accommodate a shaft for mounting purposes.

In use, as many wheels as desired are mounted on a cylinder 14 of suitable length. The wheels are so mounted that a space is provided between the ends of cylinder 14 and the edges of the cores of the outside wheels. A pair of the mounting plates 15 are then attached to the opposite ends of the assembly, with their flanges 17 extending into the cores 12 of the outside wheels adjacent the opposite ends of cylinder 14. The mounting plates 15 fit so that their flanges 17 are held within the cores 12 by friction grip, with the side portions 16 of the plates 15 bearing against the fibre strips 13 of the outside wheels of the assembly.

A bolt 19 is provided with a shank which extends through the openings 18 in the two mounting plates 15 and through the cylinder 14. The bolt 19 is screw-threaded at one end to receive a nut 20. The opposite end of the bolt 19 is provided with suitable means for attaching the assembly to a source of power driven rotation. The shank of the bolt 19 engages the outer surfaces of the openings 18, while the nut 20 bears against the surface of one mounting plate 15 adjacent opening 18 and the end of the attaching means at the opposite end of the bolt 19 bears against the opposite mounting plate 15 adjacent opening 18.

It should be noted that the cores 12 of the wheels fit by friction grip against the flanges 17 of the plates 15 and against the outside of the cylinder 14. There is further frictional engagement between the side portions 16 of the plates 15 and the fibre strips 13 of the wheels as well as between the adjacent fibre strips of the respective wheels. The result is that there is a complete frictional inter-engagement of all of the parts of the assembly, causing them to be held in a unitary and non-rotational relationship with respect to each other.

When the bolt 19 is rotated by a suitable source of

power supply, my entire multiple abrasive grinding wheel assembly rotates as a single unit, to provide a wide area grinding surface. In case the object being ground has an irregular contour, the leaves of one or more of the wheels are free to move independently of the leaves of the other wheels. My device is quickly assembled and disassembled and wheels may be added or removed, as desired, with the cylinder **14** being changed for one of the proper size. Only one size of abrasive grinding wheel need be manufactured and stocked for any size of grinding work.

It should further be noted that no change need be made in the wheels themselves and that they can be used interchangeably in a multiple assembly or by themselves.

In forming the abrasive grinding wheels which are used in my assembly, the ends of the leaves **11** are adhered to a layer of cloth **21**, or adhered to each other by being commonly adhered to a strip of plastic glue, which is in turn adhered to the central cardboard core **12**.

It may be noted that the core **12** of each end wheel **10** engages the end portion of the cylinder **14** and the flange **17** of the adjacent mounting plate **15**. This means that the cores of the two end wheels are supporting the weight of all of the other wheels, plus the weight of the cylinder. If large diameter wheels are used, this weight becomes substantial and a core made of cardboard or similar material lacks the strength to support such a weight. I have accordingly provided a modified form of my assembly for use with large diameter wheels.

A preferred embodiment of the modified form of my assembly is shown in Figs. 4 and 5 of the drawings. Substantially the same component parts are used, except that they are of larger diameter. The mounting plates **15'** are, however, provided with a second inwardly directed circular flange **22'**, which is of smaller diameter than the flange **17'**. The outer diameter of the second flange **22'** is slightly smaller than the inner diameter of the cylinder **14'**, so that the second flanges **22'** fit within the opposite ends of the cylinder **14'**.

In this way, the weight of the wheels is carried by the mounting plates **15'** rather than by the cores **12'** of the end wheels. The length of the second flange **22'** is preferably such that a slight clearance is provided between the end of the first flange **17'** and the end of the cylinder **14'**.

I claim:

1. A multiple abrasive grinding wheel assembly comprising a plurality of abrasive grinding wheels, each of said wheels having a plurality of leaves attached at one end thereof to a central circular core, the other ends of said leaves being free, each of said wheels having a pair of circular side strips attached on the opposite sides thereof, said side strips extending radially outwardly from said core, mounting means for said wheels comprising a hollow rigid cylinder having an outside diameter substantially equal to the inside diameter of the cores of said wheels, said cylinder extending through the cores of said wheels, said cylinder being slightly shorter in length than the combined widths of said wheels so that said cylinder terminates short of the ends of the cores of the outside wheels of the assembly, a pair of mounting plates disposed on opposite ends of the assembly, each of said mounting plates having a circular radial flange adjacent the outer circumferential edge thereof overlying the side strip of the adjacent outside wheel, each of said mounting plates having an inwardly directed flange extending at substantially a right angle to said radial flange, said inwardly directed flanges being substantially equal in diameter to the outside diameter of said cylinder, said inwardly directed flanges extending into the cores of the outside wheels of the assembly and having their ends disposed adjacent the opposite ends of said cylinder, all of the wheels of said assembly except the outside wheels thereof being supported entirely by said cylinder, the ends of said cylinder being supported by the cores of the outside wheels, said cores being in turn supported by said inwardly directed flanges, the cores of said wheels being frictionally engaged with the side strips of the adjacent wheels, the outer side strips of the outside wheels being frictionally engaged with the radial flanges of said mounting plates, so that frictional inter-engagement is provided between all of the parts of the assembly to prevent rotation thereof in other than a unitary manner, and a shaft substantially smaller in diameter than said cylinder extending between said mounting plates along the longitudinal axis of said cylinder, said shaft carrying means holding said mounting plates together with said wheels therebetween.

2. The subject matter of claim 1, the side strips of said wheels being sufficiently thick to separate the leaves of each of said wheels a sufficient distance from the leaves of the adjacent wheels to permit the leaves of each wheel to move independently from the leaves of the other wheels in following an irregular surface.

3. The subject matter of claim 1, each of said mounting plates having a second inwardly directed flange concentric with said first named inwardly directed flange, said second flanges being substantially equal in diameter to the inside diameter of said cylinder, said flanges extending into the opposite ends of said cylinder and frictionally engaging the inside surface of said cylinder to provide frictional engagement between said mounting plates and said cylinder.

4. A multiple abrasive grinding wheel assembly comprising a plurality of abrasive grinding wheels, each of said wheels having a plurality of leaves attached at one end thereof to a central circular core, the other ends of said leaves being free, mounting means for said wheels comprising a hollow rigid cylinder having an outside diameter substantially equal to the inside diameter of the cores of said wheels, said cylinder extending through the cores of said wheels, said cylinder being slightly shorter in length than the combined widths of said wheels so that said cylinder terminates short of the ends of the cores of the outside wheels of the assembly, a pair of mounting plates disposed on opposite ends of the assembly, each of said mounting plates having a circular radial flange adjacent the outer circumferential edge thereof overlying the adjacent outside wheel, each of said mounting plates having an inwardly directed flange extending at substantially a right angle to said radial flange, said inwardly directed flanges being substantially equal in diameter to the outside diameter of said cylinder, said inwardly directed flanges extending into the cores of the outside wheels of the assembly and having their ends disposed adjacent the opposite ends of said cylinder, all of the wheels of said assembly except the outside wheels thereof being supported entirely by said cylinder, the ends of said cylinder being supported by the cores of the outside wheels, said cores being in turn supported by said inwardly directed flanges, the cores of said wheels being frictionally engaged with the outside surface of said cylinder, each of said wheels being frictionally engaged with the adjacent wheels, the outside wheels being frictionally engaged with the radial flanges of said mounting plates, so that frictional inter-engagement is provided between all of the parts of the assembly to prevent rotation thereof in other than a unitary manner, and a shaft substantially smaller in diameter than said cylinder extending between said mounting plates along the longitudinal axis of said cylinder, said shaft carrying means holding said mounting plates together with said wheels therebetween.

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