Jan. 7, 1958 R. W. BERNSTEIN 2,818,692

ABRASIVE GRINDING WHEEL

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FIG. 1.

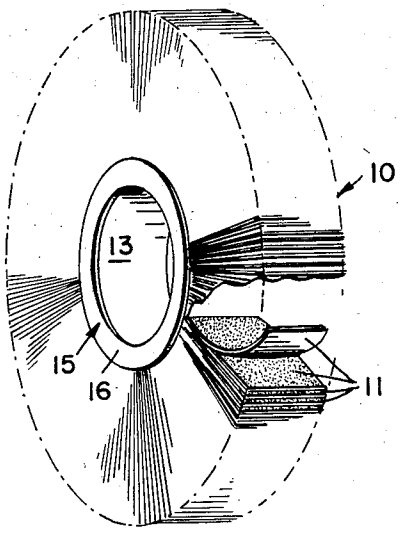


FIG. 2.

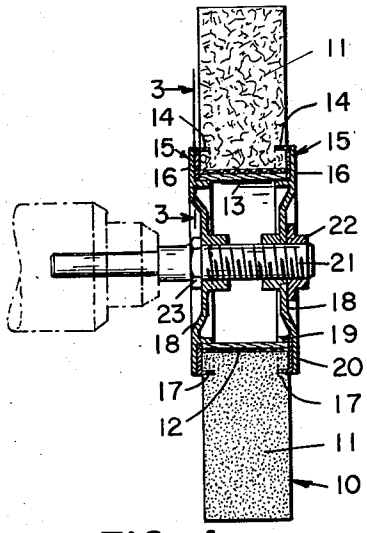


FIG. 3.

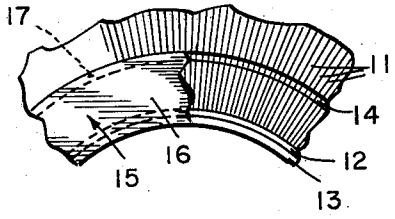


FIG. 4.

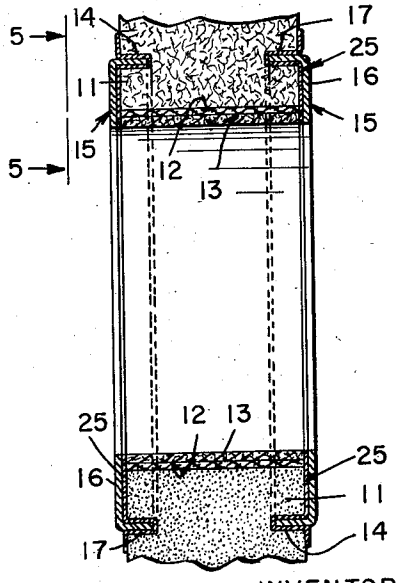
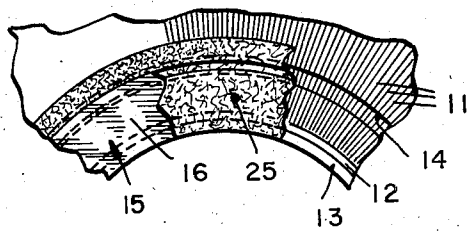


FIG. 5.



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ABRASIVE GRINDING WHEEL

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6 Claims. (Cl. 51—193.5)

This invention relates to abrasive grinding and polishing wheels.

It is an object of my invention to provide a new and improved construction for devices of the class described which comprise a plurality of leaves secured around a central circular core to form a replaceable and disposable grinding wheel.

It is particularly an object of my invention to provide a grinding wheel of the type described which is stronger than those now in use and in which the leaves are held more firmly in place.

In essence, my invention contemplates an abrasive grinding wheel which includes a plurality of leaves, the inner ends of which are secured to a central circular core. Each side of the wheel is provided with an annular groove which is concentric with the core and disposed outwardly therefrom. The groove extends into the side edges of the leaves. A circular metal reinforcing member is adhered to each side of the wheel, extending from the edge of the core outwardly to the groove. The reinforcing member is provided with an integral annular right angular lip which extends into the groove. The reinforcing member is held by glue, which also permeates the area between the leaves. The result is that the hub of the wheel from the core to the groove is in effect formed into a compact or solid unit, with the leaves being firmly held in place.

It is also contemplated that a piece of paper or other suitable material which is larger in diameter than the metal reinforcing member may be adhered between the reinforcing member and the side of the wheel with a portion thereof being held within the groove by the lip of the reinforcing member.

It is accordingly an object of my invention to provide an abrasive grinding wheel having the advantages and benefits of the structure described. 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 drawing preferred embodiments of my invention, it should be understood that the same are susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings,

Fig. 1 is a perspective view of an abrasive grinding wheel formed in accordance with my invention;

Fig. 2 is a sectional view of the same mounted for rotation;

Fig. 3 is an enlarged plan view partly broken away taken on lines 3—3 of Fig. 2;

Fig. 4 is an enlarged sectional view of the center portion of an alternative embodiment of my abrasive grinding wheel;

Fig. 5 is an enlarged plan view partly broken away taken along line 5—5 of Fig. 4.

A preferred embodiment which has been selected to illustrate my invention comprises an abrasive wheel 10 which comprises a plurality of leaves 11, at least some of which carry suitable abrasive material. The inner ends

of the leaves 11 are adhered to a strip 12, which is in turn adhered to a circular central core 13.

In order to prevent separation of the leaves 11 from the core 13, particularly during high speed rotational use of the wheel 10, I provide a pair of circular grooves 14 in the side edges of the wheel 10. These grooves 14 are concentric with and of greater diameter than the core 13.

A pair of metal reinforcing members 15 are formed so that each has a flat portion 16 with circular inner and outer diameters. The inner diameter of the flat portion 16 is substantially identical with that of the central core 13. The outer diameter of the flat portion 16 is substantially identical with that of the groove 14.

Each of the reinforcing members 15 is provided along its outer periphery with a right-angular lip 17 having a length substantially equal to the depth of the groove 14 and a diameter coincidental therewith.

A suitable adhesive preparation such as vinyl glue or the like is applied to the inside of the reinforcing member 15 and/or to the outer side edges of the wheel 10 along the area between the core 13 and groove 14. The metal reinforcing members 15 are then adhered to the sides of the wheel 10, with the lips 17 extending into the grooves 14. The lips 17 preferably completely fill the grooves 14. The adhesive material which adheres the reinforcing member 15 to the wheel 10 will also pass into the area between the individual leaves 11 and will thus act to form a substantially solid hub for the wheel 10, such hub extending from the core 13 to the groove 14. When the wheel 10 is worn out, the metal reinforcing members 15 are discarded along with the remainder of the wheel.

It will be noted that I have provided a construction which is considerably stronger than merely mounting a ring in a groove, as has been done previously, for the reason that the lip 17 not only acts as a ring, but is also an integral part of the reinforcing member 15 which is adhered to the wheel 10 and which is in turn further reinforced during rotational use of the wheel.

In use, the wheel 10 is mounted between a pair of side plates 18, each of which has a right-angular shoulder 19 which overlies the edge formed by the core 13 and reinforcing member 15. Each of the side plates 18 also has a flange 20 which extends substantially parallel to and overlies the reinforcing members 15.

An arbor 21 extends through the side plates 18, one end of the arbor 21 being suitably mounted for rotation. A nut 22 is carried by the opposite screw threaded end of the arbor 21 and holds the side plates 18 between it and a hexagonal flange 23 carried by the opposite end of the arbor 21.

The construction thus provided by this combination is stronger and more effective than those previously known in the art for securely mounting and holding a plurality of abrasive leaves in the form of an abrasive wheel.

In Figs. 4 and 5 of the drawings, I have shown an alternative embodiment of my invention in which I have provided an auxiliary disc 25, which is disposed between the reinforcing member 15 and the side of the wheel 10. The disc 25 may be formed of any suitable material such as paper, fabric or the like. The inner diameter of the disc 25 is substantially identical with that of the core 13.

The disc 25 is of such size that it will extend down into the groove 14 around the edge of the lip 17, with its outer edge being secured to the side of the wheel 10. The disc 25 is preferably secured to the wheel 10 and to the reinforcing member 15 by suitable adhesive material such as vinyl, glue or the like.

The purpose of the disc 25 is to absorb part of the glue and to slightly distort the side edges of the leaves and also to provide a firmer bond between the reinforcing member 15 and the sides of the wheel 10. In this respect, its ac-

tion may be described as being similar to that of a gasket.

I claim:

1. A unitary replaceable abrasive grinding wheel adapted to be mounted between a pair of rigid plates for rotational use, said wheel comprising a plurality of leaves secured at one end thereof to a circular core to form a wheel, at least some of said leaves having an abrasive surface thereon, said wheel having a pair of circular grooves in the opposite sides thereof adjacent to said core and substantially concentric therewith, and a metal reinforcing member permanently adhered to each side of said wheel, said reinforcing members extending from the core of said wheel to said grooves, each of said reinforcing members having a circular right angular lip disposed within one of said grooves, the size of said lip being substantially equal to the size of said groove so that said lip substantially fills said groove, said wheel adapted to be removed from between said side plates and replaced with another wheel when said leaves have become worn down to the core, the core and reinforcing members of said wheel being discardable when said wheel is replaced.

2. The method of forming an abrasive wheel comprising securing the inner ends of a plurality of leaves to a circular core, at least some of said leaves carrying abrasive material, forming a pair of circular grooves in the side edges of said wheel, said grooves being adjacent to and concentric with said core, and securing a plastic reinforcing member to each side of said wheel with adhesive material, said reinforcing member extending from said core to said groove and having a lip fitting into and substantially filling said groove, said adhesive material extending into the area between said leaves to form the area between said core and groove beneath said reinforcing members into a substantially solid hub to prevent separation of said leaves from said wheel.

3. A unitary replaceable abrasive grinding wheel adapted to be mounted between rigid plates for rotational use, said wheel comprising a plurality of leaves having their inner ends secured to a circular core, at least some of said leaves carrying abrasive material, a pair of circular grooves formed in the opposite side edges of said wheel, said grooves being adjacent to and concentric with said core, a metal reinforcing member permanently secured to each side of said wheel with adhesive material, said reinforcing member extending from said core to said groove, said reinforcing member having a lip fitting into and substantially filling said groove, said adhesive material extending into the area between said leaves to form the area between said core and grooves beneath said reinforcing members into a substantially solid hub to prevent the separation of said leaves from said wheel, said wheel adapted to be removed from between said side plates and replaced with another wheel when said leaves have become worn down to said core, the core and reinforcing members of said wheel being discardable when said wheel is replaced.

4. A unitary replaceable abrasive grinding wheel adapted to be mounted between rigid plates for rotational use, said wheel comprising a plurality of leaves having their inner ends secured to a circular core, at least some of said leaves carrying abrasive material, a pair of circular grooves formed in the opposite side edges of said wheel, said grooves being adjacent to and concentric with said core, a reinforcing member permanently secured to each side of said wheel with adhesive material, said reinforcing member extending from said core to said groove, said reinforcing member having a lip fitting into and substantially filling said groove, said adhesive material extending into the area between said leaves to form the area between said core and grooves beneath said reinforcing members into a substantially solid hub to prevent the separation of said leaves from said wheel, said wheel adapted to be removed from between said side plates and replaced with another wheel when said leaves have become worn down to said core, the core and reinforcing members of said wheel being discardable when said wheel is replaced.

5. A unitary replaceable abrasive grinding wheel adapted to be mounted for rotational use, said wheel comprising a plurality of leaves secured at one end thereof around a central circular space to form a wheel having an open center, at least some of said leaves having an abrasive surface thereon, said wheel having a pair of circular grooves in the opposite sides thereof adjacent to the open center of said wheel and substantially concentric therewith, and a rigid reinforcing member permanently adhered to each side of said wheel, said reinforcing members extending from the open center of said wheel to said grooves, each of said reinforcing members having an annular substantially right angular lip extending into and disposed within one of said grooves to prevent the separation of the said leaves from said wheel, said lips substantially filling said grooves.

6. The structure set forth in claim 5, and a pair of substantially circular auxiliary discs formed of substantially flexible material, each of said discs having a diameter greater than that of said reinforcing members, one of said discs being disposed between each of said reinforcing members and the side of said wheel to provide a firmer bond between said reinforcing members and said wheel.

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