Nov. 5, 1946. A. VONNEGUT 2,410,536

EXPANSIBLE WHEEL

Filed Oct. 31, 1945

FIG. 1

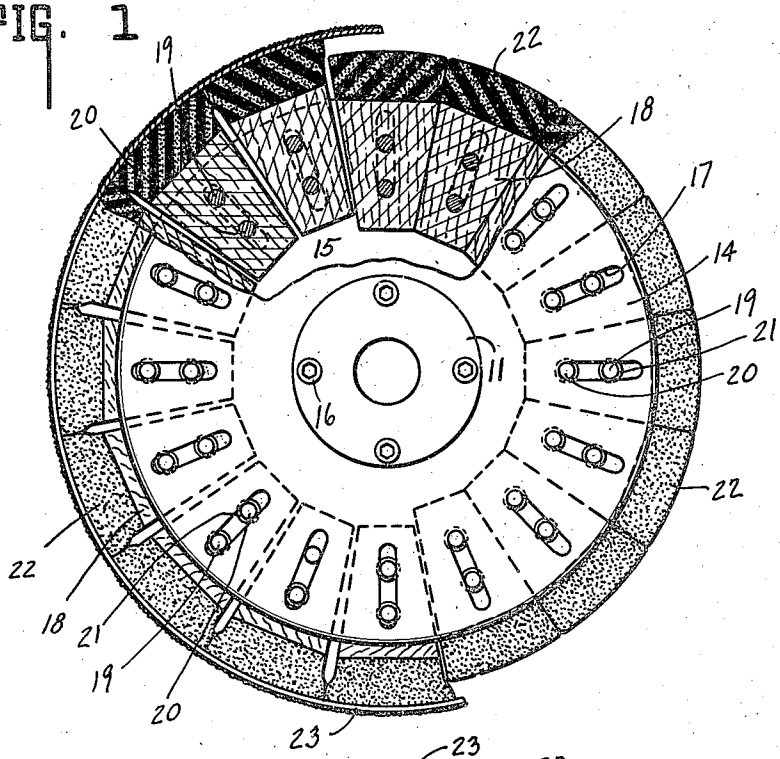
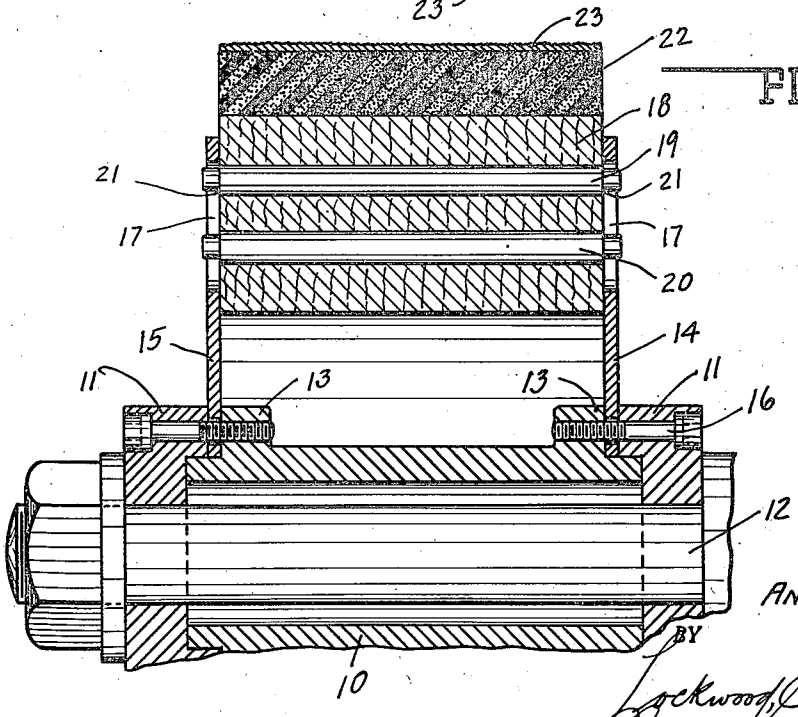


FIG. 2



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EXPANSIBLE WHEEL

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7 Claims. (Cl. 51—191)

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This invention relates to an expansible wheel, applicable for mounting or controlling endless grinding or buffing belts or bands of abrasive for providing an abrasive surface.

It is the object of this invention to provide an expansible wheel of this character adapted to be expanded to increase its diameter for engagement with an abrasive belt or band through the action of centrifugal force upon operative rotation. The particular feature of the invention resides in the mounting of an annular series of truncated segments in a manner to control their relation and movement relative to each other radially of the wheel into and out of expanded position, and wherein each of said segments is formed to provide a resilient cushioned periphery to enable the wheel to conform to minor variations and contours of the article to be worked, but more particularly wherein the independent mounting of the individual segments permits of increased variations in the surface of the wheel to conform to more extreme contours.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is a side elevational view of the expansible wheel showing the left side thereof with the parts in expanded position, and the right side thereof in normal position, and with a portion at the top thereof broken away to show said wheel in section.

Fig. 2 is a central vertical section through the upper portion of the wheel, with the spindle shown in elevation.

In the drawing there is shown an expansible wheel which, through the action of centrifugal force upon operative rotation, is caused to expand radially or enlarge itself into operative engagement with an endless abrasive band or belt. As illustrated herein, and showing one modification of the invention, there is provided a central hub 10 carrying end bearing supports 11 secured to each end thereof, and which bearing supports are keyed or otherwise secured to a rotating spindle 12 which may be driven by an electric motor or any other suitable power source. Each end of the hub is flanged to provide a shoulder as indicated at 13 to receive the opposed spaced annular end plates 14 and 15, respectively, to provide a rim mounting. The inner portions of said plates are clamped and locked against the shoulders 13 of the hub by a corresponding and nesting portion of the bearing supports 11. For this purpose the bolts 16 extend at spaced intervals about the bearing members through apertures

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provided in the end plates 14, 15 and into the shouldered flanges of the hub 10.

Each of said end plates 14, 15 is provided with a series of radially-extending elongated slots 17 equally spaced in annular arrangement thereabout. Mounted for slidable movement between and carried by said end plates there is a series of truncated rim forming sections 18 arranged face to face in annular formation. The adjacent faces of said sections extend in radial planes radiating from the axial center of the hub. Each of said sections is provided with a pair of spaced supporting members, such as the rods 19, 20 extending longitudinally therethrough from one end to the other with their ends extending through the respective slots 17. Each pair of said rods lies in the same radial plane with the spacing between their outer surfaces being less than the length of the elongated slots in which they are carried so that each pair of rods is permitted to slide intermediate the ends thereof. Preferably the ends of said rods which engage for sliding movement within the slots are reduced to provide a bearing shoulder indicated at 21 of greater diameter than the width of the slots 17, so as to slidably bear against the inner surfaces of the end plates 14, 15.

Each of the outer exposed faces of said sections has mounted thereon a yielding pad 22, which may comprise sponge rubber, felt or like material. Said sections and pads are so formed and related that when the innermost rods seat adjacent the innermost ends of the elongated slots, the outer surfaces of the series of pads form a wheel adapted to receive thereabout or engage an endless belt or band 23 of abrasive material, such as sandpaper, emery cloth or the like. In such retracted position of the sections shown in Fig. 1, the endless belt or band may be conveniently slipped in place over the periphery of the wheel or removed therefrom. Upon the wheel being rotated at an operative speed by the spindle 18, the action of centrifugal force will throw the sections 18 radially outward. In their outermost position, guided and limited by the supporting members or rods sliding in the slots 17, they will engage the endless abrasive belt to stretch it under the yielding force applied to the sponge rubber pads 23.

In such expanded position, as shown in the left-hand side of Fig. 1, the expansible wheel may be operated to apply the abrasive band or belt for grinding, buffing or polishing during operative rotation thereof. By reason of the pads, the abrasive surface is rendered yielding to contours

as well as the individual slidably mounted rim-forming sections. Upon the wheel being brought to rest, said sections may be collapsed inwardly to retracted position to permit ready disengagement or removal and replacement of the abrasive belt.

The invention claimed is:

1. An expansible wheel for application to an endless abrasive belt comprising a hub, an annular rim mounting secured to said hub to extend radially outwardly thereof, said end mounting being provided with a series of substantially radially extending elongated slots equally spaced thereabout, a series of truncated rim-forming sections, and radially extending projections carrying said sections extending into the elongated slots of said mounting and slidable therein to maintain said sections in juxtaposition while permitting radial movement thereof outwardly to expanded position under the influence of centrifugal force upon operative rotation thereof.

2. An expansible wheel for application to an endless abrasive belt, comprising an annular rim mounting, a series of truncated rim forming sections mounted face to face in annular formation, means for slidably supporting said sections upon said mounting to permit their radial movement relative thereto, said sections when retracted being adapted to engage the endless belt and being movable radially outward thereagainst under the influence of centrifugal force against said belt when rotated at operative speed.

3. An expansible wheel for application to an endless abrasive belt comprising an annular rim mounting, an annular series of truncated rim-forming sections mounted annularly about said mounting in face to face relation, means for slidably supporting said sections upon said mounting to permit limited radial movement thereof, a portion of said sections extending beyond the peripheries of said mounting to provide an annular surface for engagement with said belt, and a yielding cushion secured over the faces of each of said sections for yielding engagement with said belt upon said sections being thrown radially outwardly under the influence of centrifugal force upon operative rotation thereof.

4. An expansible wheel for application to an endless abrasive belt, comprising a hub, a pair of annular end plates secured to said hub in spaced relation, said end plates being provided with a series of substantially radially-extending elongated slots equally spaced thereabout concentrically with said hub, a series of truncated rim-forming sections mounted face to face about said hub and independently slidable between said plates, a pair of spaced supporting pins carried by each of said sections slidably carried in said slots respectively to permit of limited radial movement of their respective sections, and a resilient pad mounted upon the outer exposed face of each section, said sections being slidable radially outward by centrifugal force to engage and stretch the abrasive belt upon operative rotation thereof.

5. An expansible wheel for application to an endless abrasive belt, comprising a hub, an annular rim mounting secured to said hub, a series of truncated rim-forming sections mounted face to face about said hub and slidable radially upon said mounting, and pin and slot means for slidably supporting and guiding said sections upon said mounting for limited radial sliding movement relative thereto, said pin and slot means permitting said sections to collapse for providing the wheel with an annular peripheral surface to loosely engage the endless abrasive belt while permitting radial and individual movement of said sections outwardly to expanded wheel position under the influence of centrifugal force for stretching said belt upon operative rotation thereof.

6. An expansible wheel for application to an endless abrasive belt, comprising a hub, an annular rim mounting secured to said hub, a series of truncated rim-forming sections mounted face to face about said hub and slidable radially of said mounting, pin and slot means for slidably securing and guiding said sections upon said mounting for limited radial sliding movement therebetween, and a resilient pad secured over the outer exposed surface of each of said sections, said pin and slot means permitting said sections to collapse for providing the wheel with an annular peripheral surface to loosely engage the endless abrasive belt while permitting radial and individual movement of said sections outwardly to expanded wheel position under the influence of centrifugal force for engaging and stretching said belt upon operative rotation thereof.

7. An abrading wheel having two spaced discs; means for connecting said discs in axially aligned positions; transversely aligned, radial guides formed in the discs, adjacent the peripheries thereof; transversely disposed weights freely mounted in the guides; and an oversized abrading band surrounding the weights and adapted upon rotation of the wheel to be held under tension by contact with, and the centrifugal force set up by, the weights.

ANTON VONNEGUT.

Disclaimer

2,410,536.—*Anton Vonnegut*, Indianapolis, Ind. EXPANSIBLE WHEEL. Patent dated Nov. 5, 1946. Disclaimer filed Oct. 11, 1948, by the assignee, *Vonnegut Moulder Corporation*.

Hereby enters this disclaimer to that part of claim 2 in said specification which is in the following words, to wit:

"A series of truncated rim forming sections" other than wherein said rim forming sections are wedge-shaped with their major defining faces extending at an angle to each other, and

"Means for slidably supporting said sections upon said mounting" other than wherein said sections slide upon said mounting, and said means is of a rigid character and not flexible or yielding.

[*Official Gazette November 9, 1948.*]