

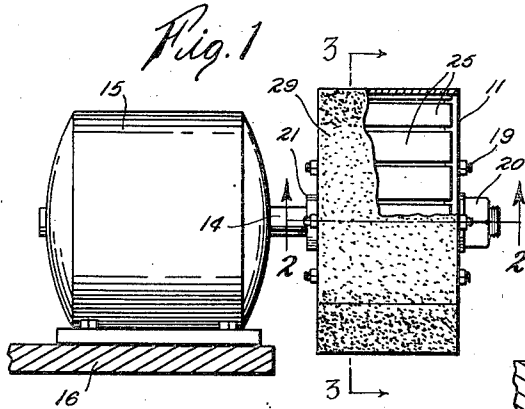
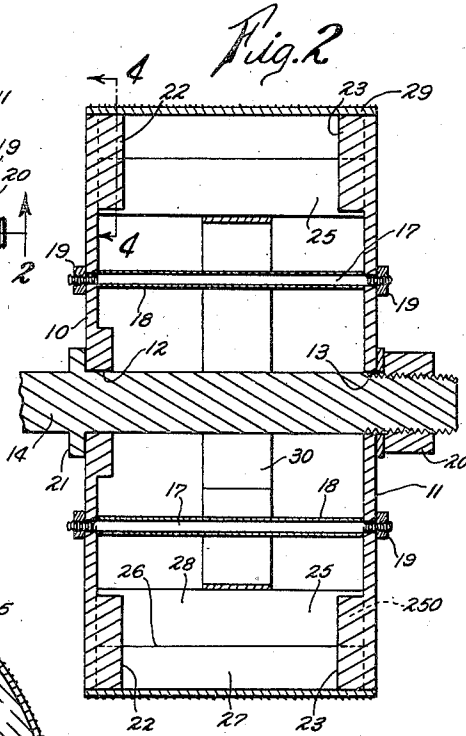
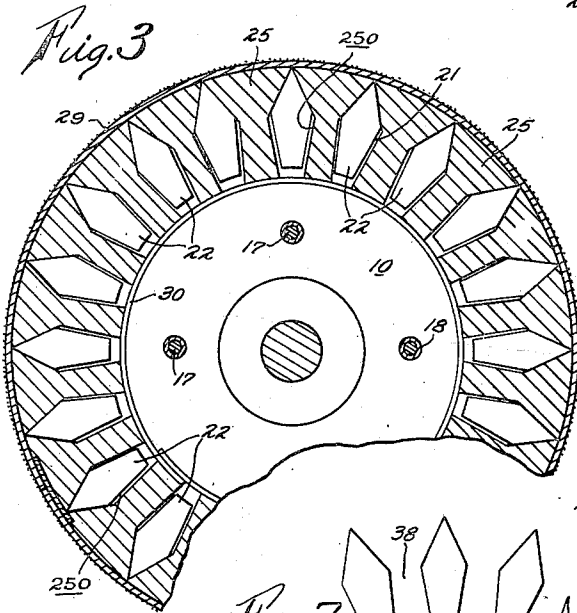
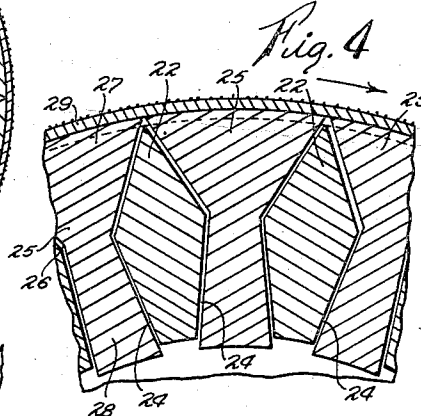
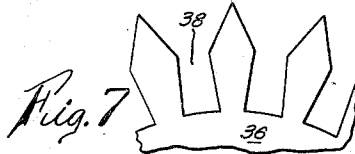
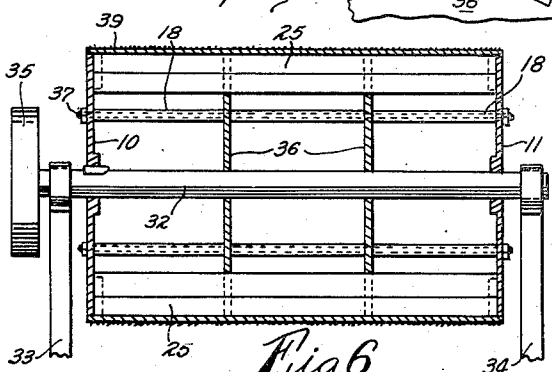
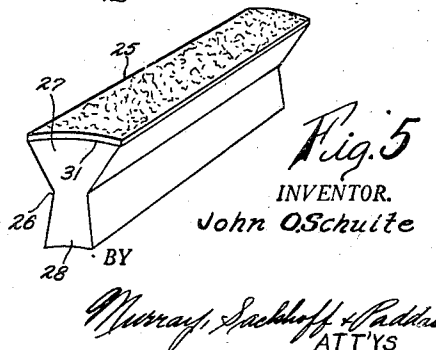
Feb. 4, 1947.

J. O. SCHULTE

2,415,308

CENTRIFUGALLY EXPANSIBLE ABRASIVE WHEEL

Filed May 23, 1945



UNITED STATES PATENT OFFICE

2,415,308

CENTRIFUGALLY EXPANSIBLE ABRASIVE
WHEELJohn O. Schulte, Cincinnati, Ohio, assignor to
Vonnegut Moulder Corporation, a corporation

Application May 23, 1945, Serial No. 595,385

4 Claims. (Cl. 51-191)

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The present invention relates to improvements in abrading devices and has for its principal object the provision of a simplified wheel structure for maintaining a flexible abrasive band under tension for operation upon a work piece.

Another object of the invention is to provide in an abrading wheel a means, responsive to the rotation of said wheel, for resiliently tensioning a flexible abrading band.

A further object of the invention is to provide a number of weights which float in radial guides formed in the wheel for maintaining a flexible abrading band in operative, expanded condition when said wheel is rotated in the usual manner.

A still further object of the invention is to provide abrasive band tensioning and mounting means which is operative during wheel rotation and which provides a means for moving the band when the wheel is at rest.

Other objects will be apparent from the following specification and drawing wherein:

Fig. 1 is a fragmentary side elevational view of my abrading wheel mounted on a driving means therefor.

Fig. 2 is an enlarged, cross-sectional view taken on line 2-2 of Fig. 1.

Fig. 3 is an enlarged, cross-sectional view taken on line 3-3 of Fig. 1, parts thereof being broken away.

Fig. 4 is an enlarged, cross-sectional view taken on line 4-4 of Fig. 2.

Fig. 5 is a perspective view of one of the weights for my wheel.

Fig. 6 is a cross-sectional view of a modified form of my wheel.

Fig. 7 is a fragmental, side view of the periphery of one of the webs shown in Fig. 6.

The embodiment of my invention comprises an abrading wheel having two space discs 10 and 11 provided with concentric arbor holes 12 and 13 respectively for receiving a rotatable drive shaft 14. As is illustrated in Fig. 1, the shaft 14 may be the extension of the motor shaft of an electric motor 15 bolted in any suitable manner to a support 16. The discs are held in axially aligned positions by means of tie rods 17 which pass through spacing sleeves 18 and are threaded at their outer ends to nuts 19. The wheel is fixed to the shaft 14 by a nut 20 which cooperates with the outer threaded end of the shaft 14 to tighten the wheel against a shoulder 21 formed on the shaft.

As most clearly shown in Figs. 2, 3 and 4 the adjacent face of each disc 10 and 11 is provided with a circular row of radially disposed projections 22 and 23 respectively each of which are

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substantially diamond shaped in transverse elevation. Each row of projections 22 and 23 is disposed at the periphery of its respective disc and the projections in each row are spaced at equal angular distances to form radially extending guides 24 and 25 respectively between them. The guides 24 and 25 are disposed in transverse alignment and freely but snugly receive the ends of weights 25. These weights have a restricted intermediate portion 26, outwardly flaring heads 27 and inwardly flaring bases 28 (Fig. 5).

As indicated in Fig. 4, the diamond shaped projections form between them guides which have outwardly flaring openings, restricted central portions and inwardly flaring inner portions. The guides each have a transverse shape which substantially conforms to the cross-sectional shape of the weights but are minutely larger than the width of the weights so that said weights have a certain amount of relative movement in the guides which may vary from one-eighth ($\frac{1}{8}$ "') inch to one-fourth ($\frac{1}{4}$ "') inch in a radial direction (Fig. 4).

Surrounding the wheel is a flexible abrasive band 29 having an over-sized circumference with reference to that of the wheel so that it may be slid over the wheel for removal or replacement purposes, when said wheel is stationary. A flat expansion spring 30 is disposed within the wheel and bears outwardly against the base of each of the weights to facilitate the assembly of the weights in the wheel.

In operation, as indicated in Fig. 4, the weights 25 float within the end guides formed in the spaced discs and are urged radially outward against the flexible band by the centrifugal force set up by the rotation of the wheel. The weights each exert the same outward pressure upon the abrasive band and create a tension therein which is controlled by the speed of rotation of the wheel and/or the mass of the individual weights; a relatively high rotational speed being adapted for harsh or heavy abrading work, whilst the slow rotational speed creates a soft or light abrading action on the work. As indicated in Fig. 5 the outer arcuate faces 31 of the weights may be provided with a sheet of any suitable substance which may be adhesively bound thereto to provide for various types of abrading actions. Felt, rubber or canvas are examples of suitable substances for these weights and progressively, in the order named, give harder abrading actions.

The structure indicated in Figs. 1-5 may also be modified to provide an extended abrading wheel for operation on various types of work.

This modification, as illustrated in Figs. 6 and 7, has a shaft 32 journaled at its ends in standards 33 and 34 and may be rotated by a belt pulley 35, or the like. The discs 10 and 11 are mounted on the shaft and have interposed between them a number of webs 36 which are held in spaced relation by sleeves 18 through which are passed suitable tie rods 37. Elongated weights 25 are freely mounted in the guides formed in the discs 10 and 11 and also freely pass through slots 38 (Fig. 7) formed in the peripheries of the webs 36. An abrading sleeve 39 having a slightly larger diameter than the wheel surrounds the weights and during operation of the wheel is held in tension by the centrifugal force set up in said weights. The base of the outboard standard 34 (not shown) is provided with a conventional demountable connection so that said standard may be removed to replace or remove abrasive bands 39.

What is claimed is:

1. An abrading wheel having two spaced discs; means for connecting said discs in axially, aligned positions; transversely aligned guides formed in adjacent faces of the discs and each located in a radial position at the periphery of its respective disc, and having a restricted intermediate portion; transversely disposed weights having the ends thereof conforming to, and freely mounted in, the guides; and an over-sized abrading band surrounding the outer surfaces of the weights and adapted upon rotation of the wheel to be held under tension by contact with, and the centrifugal force set up in, the weights.

2. An abrading wheel having two spaced discs; means for connecting said discs in axially, aligned positions; transversely aligned guides formed in adjacent faces of the discs and each located in a radial position at the periphery of its respective disc, and having a restricted intermediate portion, an outwardly flaring mouth and an inwardly flaring inner portion; transversely disposed weights having the ends thereof conforming to, and freely mounted in, the guides; and an oversized abrading band surrounding the outer surfaces of the weights and adapted upon rotation of the wheel to be held under tension by contact with, and the centrifugal force set up in, the weights.

3. An abrading wheel having two spaced discs; means for connecting said discs in axially, aligned positions; transversely aligned guides formed in adjacent faces of the discs and each located in a radial position at the periphery of its respective disc, and having a restricted intermediate portion, an outwardly flaring mouth and an inwardly flaring inner portion; elongated weight blocks extending transversely of the discs and each having an outwardly flaring head, an inwardly flaring base and a restricted intermediate portion, the ends of each block being freely mounted in the guides; and an over-sized abrading band surrounding the outer surfaces of the weights and adapted upon rotation of the wheel to be held under tension by contact with, and the centrifugal force set up in, the weights.

4. An abrading wheel having two spaced discs; means for connecting said discs in axially, aligned positions; transversely aligned guides formed in adjacent faces of the discs and each located in a radial position at the periphery of its respective disc, and having a restricted intermediate portion, an outwardly flaring mouth and an inwardly flaring inner portion; elongated weight blocks extending transversely of the discs and each having an outwardly flaring head, an inwardly flaring base and a restricted intermediate portion, the head having an outer surface conforming to an arc of the disc periphery, the ends of each block being freely mounted in the guides; and an over-sized abrading band surrounding the outer surfaces of the weights and adapted upon rotation of the wheel to be held under tension by contact with, and the centrifugal force set up in, the weights.

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