Nov. 21, 1950 E. W. HALL 2,530,960

TRAVELING BAND ABRADING MACHINE

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Fig. 1.

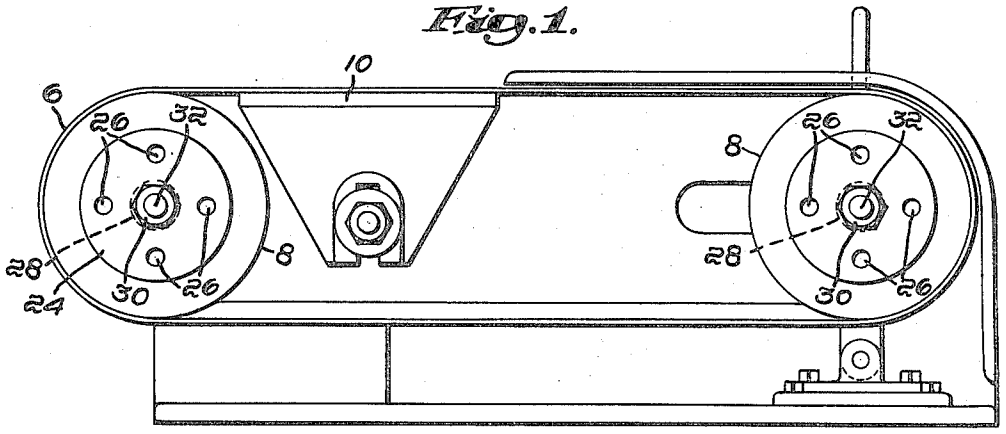
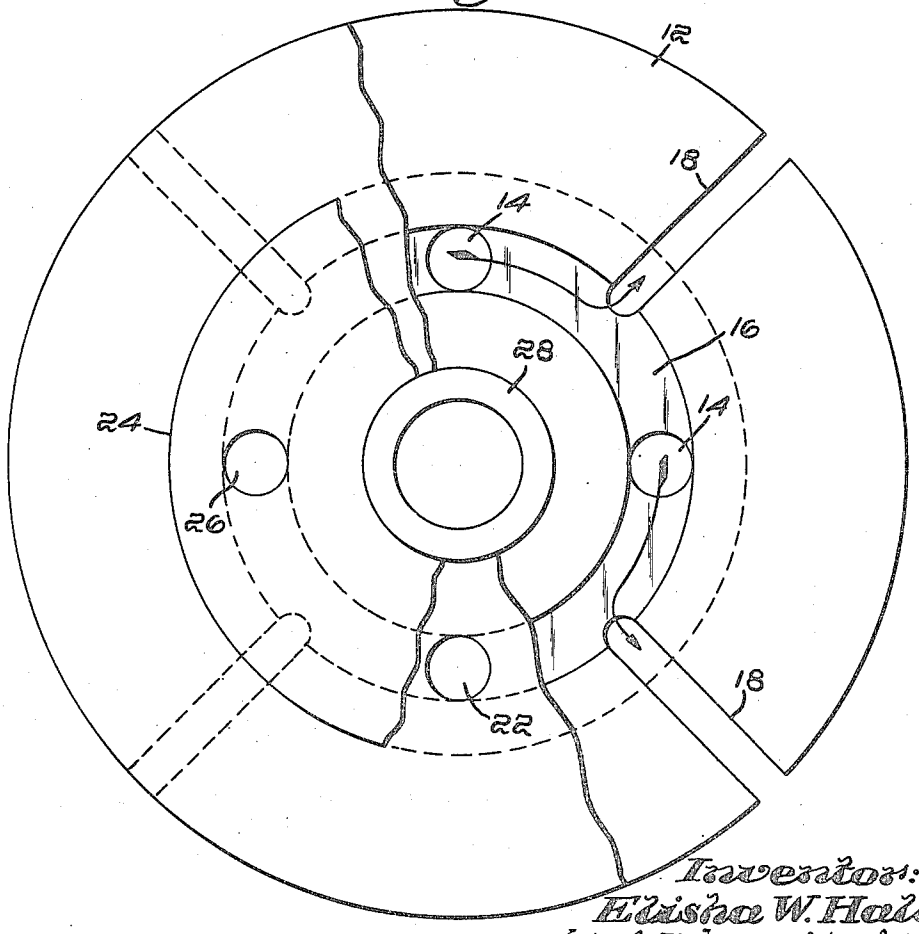


Fig. 2.



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Fig. 3.

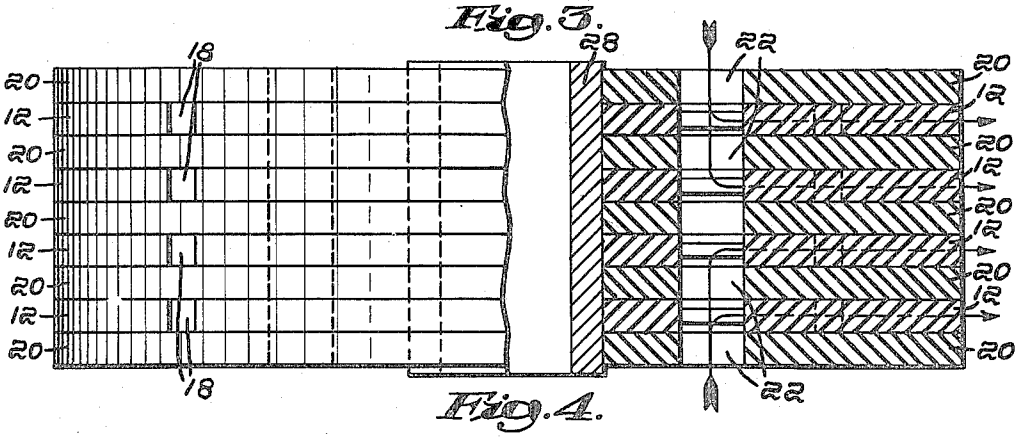


Fig. 4.

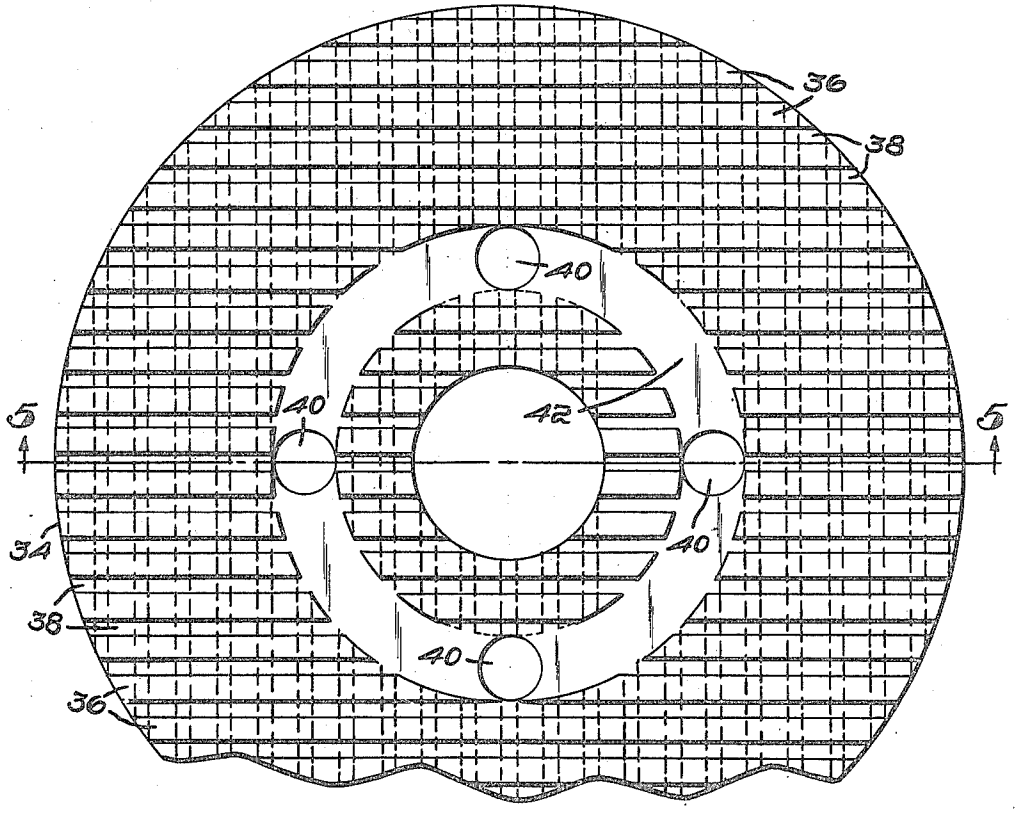


Fig. 5.



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TRAVELING BAND ABRADING MACHINE

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Application February 20, 1947, Serial No. 729,685

4 Claims. (Cl. 51—135)

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This invention relates to abrading machines of the class employing a travelling band, coated with abrasive material, and two wheels over which the band travels, one wheel being the driver, to which power is applied as by a motor, and the other being an idler. Flat work may be abraded by placing the same against the upper, horizontally travelling lead of the band, such lead resting upon a belt support limiting or preventing downward deflection of the band at a local area. Other work may be abraded by placing the work against that portion of the belt which is in contact with the periphery of one of the wheels.

In the operation of a machine of this class, considerable heat is generated. Much of this heat is, of course, due to the friction of the band with the work. But some heat is generated also, when no work is being performed, apparently by the action of the band on the peripheries of one or both wheels. Possibly this is due to the tractive effort of the driver against the inner surface of the band. Whatever may be the cause, this invention aims to cool the band, and one or both wheels by furnishing the same with an ample supply of air fed to the desired point or points by means which causes the discharge of air against the band, preferably through one or both wheels, and cooling, not only the band, but one or both wheels as well.

The invention will be understood by reference to the following description of two embodiments of the invention, while its scope will be pointed out more particularly in the appended claims.

In the drawings:

Fig. 1 is a side elevation of a travelling band abrading machine embodying the invention;

Fig. 2 is a side elevation of one of the wheels of the machine, with certain parts broken away, the better to disclose the construction.

Fig. 3 is a plan, partly in horizontal section of one of the wheels;

Fig. 4 is an elevation of a modification of one of the disks of a wheel; and

Fig. 5 is a sectional view on line 5—5 of Fig. 4.

Referring to the drawings and to the embodiments of the invention illustrated therein as examples and having reference at first to Fig. 1, there is shown an abrading machine comprising an endless band 6 passing over two wheels 8, one of which (herein the one at the left) is the driver and the other an idler. The upper horizontal lead of the band passes over and rests upon a band support 10 which prevents or at least limits downward deflection of the band by flat abrading operations in which the work is pressed downwardly upon the band. Other work is performed with one of the wheels (herein the one at the left) as the backing for the band, in which case it is desirable to provide a certain amount of yielding of the wheel as by making the same of resilient material such as rubber or rubber-like or other suitable cushioning material.

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One convenient way of supplying air to the band, and the one which I have chosen as an example, is a means associated with the wheel as by an internal arrangement of passages within the wheel itself. One such construction will now be described, reference being had at first to Fig. 3 which shows a wheel partly in plan and partly in horizontal section. In this example, there are two sets of disks, the disks of one set alternating with the disks of the other set. One set comprises disks 12 made of appropriate semi-soft material such as rubber, for example, provided with a plurality of holes 14 therethrough (in the direction of the axis) and equally spaced angularly, in this case four holes whose centers are 90° apart, though the number and spacing may be varied. These holes are connected by one or more, herein two passages, such as annular grooves 16 on both sides of the disk. The groove on one side may be omitted if desired. Thus, the holes 14 are in communication with each other, and hence air supplied to the holes will flow into the annular grooves. The air will flow thence by centrifugal force through one or more, herein four radial passages 18, at 90° and preferably alternating with the holes 14. In the present example, these passages occupy the entire thickness of the disk and each receives air from two of the annular grooves 16, and the passages extend to the periphery of the disk, where they deliver air directly to the inner surface of the belt 6.

The other set of disks 20, alternating with the disks 12, are likewise made of semi-soft material such as rubber, for example, and these disks, also, are provided with holes 22, the same in number and location as the holes 14 and communicating but not necessarily registering therewith. In the present example, the assembly of disks is held between end plates 24 of metal, for example, and also provided with like holes 26 of like number and location and communicating with the holes 22 and the holes 14, so that, in effect, the wheel has passages from one face to the other, and through which air is taken and delivered to the annular grooves 16 and thence by way of the radial passages 18 to the periphery of the wheel and to the inner surface of the travelling band. Thus, the

band and the wheel are cooled and prevented from overheating.

The several disks comprising the body of the wheel are mounted on a sleeve or bushing 28 (see Fig. 3) and the end plates 24 (see Fig. 2) usually slightly recessed on their inner faces are clamped as by nuts 30 (see Fig. 1) threaded on a spindle 32 which passes through the sleeve 28.

In another form of the invention, the several disks which compose the wheel may be alike, and one of them, illustrated in Figs. 4 and 5 is a disk 34 of rubber, for example, on each of whose faces there are ribs 36 alternating with grooves 38 (see Fig. 5), those on one face being perpendicular to those on the other face (see Fig. 4). In this form, also, there are holes 40 extending through the disk for communication with like holes of other disks, and there are annular grooves 42, one on each side, which receive air from the holes 40 and conduct the same to the grooves 38 in the faces of the disk, whence the air is delivered to the periphery.

Having thus described these embodiments of the invention, what I claim is:

1. A belt wheel for supporting an abrading belt and in operation serving to supply cooling air to the inner surface of the belt built up from a number of superposed molded annular discs of yielding homogeneous material, including discs having parallel ribs across their width, the ribs on the opposite sides of any single disc extending in different directions, the ribs on at least one side of the discs being cut away to provide an annular passage between the inner and outer circumferences of the discs, the wheel also having transverse openings extending from the faces thereof and intersecting such annular passages.

2. A belt wheel for supporting an abrading belt and in operation serving to supply cooling air to the inner surface of the belt built up from a number of superposed molded annular discs of yielding homogeneous material, and comprising a disc having parallel ribs across its width defining in cooperation with an adjacent disc inwardly extending passages, the ribs being cut away to provide an annular passage between the inner and outer circumferences of the dics, the wheel also having transverse openings extending from the faces thereof and intersecting such annular passage.

3. A belt wheel for supporting an abrading belt and in operation serving to supply cooling air to the inner surface of the belt built up from a number of superposed molded annular discs of yielding homogeneous material, and comprising discs having parallel ribs defining in cooperation with adjacent discs inwardly extending passages, ribs in the completed wheel extending in a plurality of directions, the ribs being cut away to provide an annular passage between the inner and outer circumferences of the disc, the wheel also having transverse openings extending from the faces thereof and intersecting such annular passage.

4. A belt wheel for supporting an abrading belt and in operation serving to supply cooling air to the inner surface of the belt, the wheel having a cylindrical form and comprising a number of annuli of homogeneous yielding rubber secured together in side by side contacting relation, the inner circumferences of the annuli defining a continuous cylindrical bearing surface to snugly receive a spindle, sides of certain of the annuli having recesses extending from the exterior periphery inwardly for a fraction of the radial depth of the annuli and providing ports distributed about the exterior periphery of the wheel, which periphery is otherwise continuous and uniform, sides of certain annuli inwardly of the side faces of the wheel being also recessed circumferentially between the inner and outer circumferences to connect the inwardly extending recesses at a location beneath the exterior periphery of the wheel, and openings extending from the side faces of the wheel between the inner and outer circumferences intersecting the circumferential recesses.

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