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2,378,643

GRINDING OR POLISHING MACHINE AND CONTACT ROLL THEREFOR

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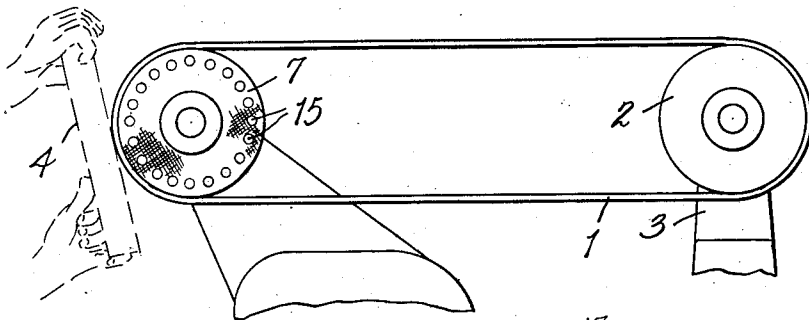


FIG. 1

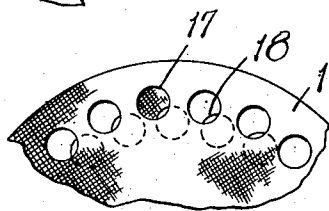


FIG. 7

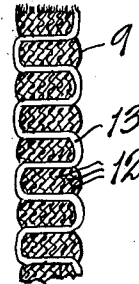


FIG. 5

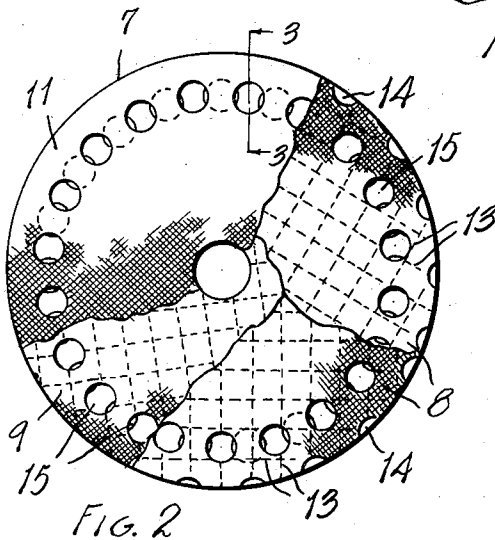


FIG. 2

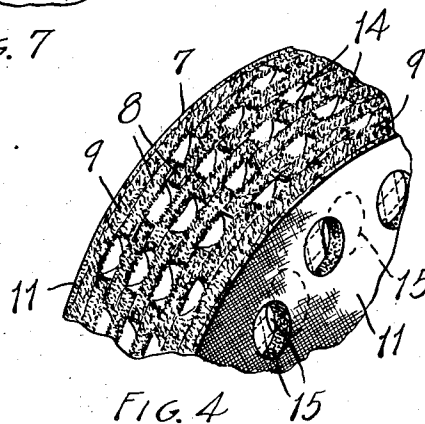


FIG. 4

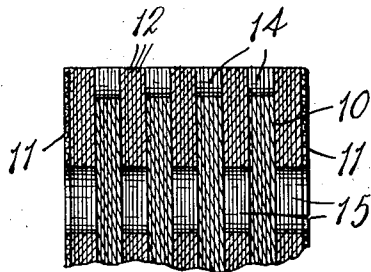


FIG. 3

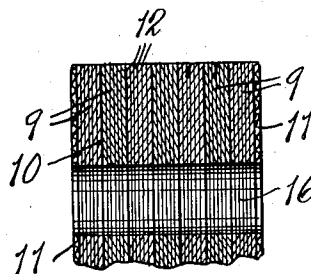


FIG. 6

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9 Claims. (Cl. 51-141)

The main objects of this invention are:

First, to provide a grinding or polishing machine of the coated abrasive belt type in which the belt is effectively supported for the presentation of the work thereto and at the same time the belt is supported with sufficient resiliency or usability to accommodate variations in the belt and in the work presented thereto.

Second, to provide a structure having these advantages which is very durable and, while very effective, minimizes the wear on the belt owing to the characteristics hereinbefore noted.

Third, to provide a contact wheel for belt grinding or polishing machines which may be economically produced, at the same time is very durable even when subjected to heavy loads.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevation of a belt grinding or polishing machine of the backstand type embodying the features of my invention, only such portions thereof being illustrated as are deemed to be required for an understanding of a practical embodiment of my invention.

Fig. 2 is a fragmentary side elevation of a contact or press roll for grinding or polishing machines embodying my invention, parts being broken away to illustrate structural details thereof.

Fig. 3 is an enlarged fragmentary section on line 3-3 of Fig. 2.

Fig. 4 is an enlarged perspective view of my improved contact roll.

Fig. 5 is a fragmentary sectional view through one of the disks of which the embodiment of my invention illustrated is formed.

Fig. 6 is a fragmentary sectional view corresponding to that of Fig. 3 of a modified form or embodiment of the invention, the peripheral recesses shown in Figs. 2, 3 and 4 being omitted.

Fig. 7 is a fragmentary side view of a modified form or embodiment of my invention.

In Fig. 1 of the accompanying drawing I illustrate portions of a belt grinding or polishing machine of the backstand type comprising a grinding or polishing belt 1 and a supporting and driving roller 2 carried by the frame 3, these parts being conventionally shown. 4 represents a piece of work manually presented to the belt in opposed relation to the contact or press roll 7.

This contact roll 7 comprises a plurality of

disks 8 and 9 arranged in side by side supporting relation, the disk 9 being the outer disk and the disk 8 the intermediate disk. These disks are secured together by means of suitable adhesive indicated at 10. Side laminae or layers 11 of suitable fabric are also provided in the embodiment illustrated.

The disks 8 and 9 are made up of a plurality of plies 12 of fabric or other suitable fibrous material and in the embodiment illustrated these plies are stitched together into the disks by means of a plurality of parallel rows of stitching 13 arranged in crossing relation. The stitching may, however, be in other forms or the stitching may be supplemented by concentric stitching or spiral stitching or the like. The stitching illustrated has the advantage of uniformity—that is, uniformity in binding the plies constituting the separate disks in coacting supporting relation and in substantially compressing the plies. The roll may be of any desired length to accommodate the particular belt or the particular type of work.

In the preferred embodiment, the intermediate disks are provided with a plurality of curved peripheral uniformly spaced recesses 14, the adjacent disks being arranged with these recesses in staggered relation as is best shown in Fig. 4. This provides a periphery having a plurality of rows of recesses, the recesses of adjacent rows being staggered. The outer disk 9 provides a continuous supporting edge. The disks 9 are also used in the embodiment shown in Fig. 6, wherein the peripheral recesses are omitted. This embodiment of my invention is well adapted for use where a less yielding pressure is desired than that resulting from the presence of the recesses.

The embodiment of my invention shown in Fig. 4, however, has the advantage of more readily conforming to irregularities in the work and the slight irregularities that normally occur in the distribution of abrasive on the belt.

In this preferred embodiment, each of the disks is provided with an annular series of transverse holes 15 arranged in uniformly spaced relation to the peripheries of the disks or in uniform spaced relation to the periphery of the roll thereby providing an annular rim-like peripheral portion at the outer sides of these holes which is more yielding than the portion at the inner side of the holes. These holes 15 of adjacent disks are preferably arranged in alternating relation and overlap as shown in Fig. 2 so that they also serve as ventilating openings.

In the embodiment shown in Fig. 6 the peripheral holes are omitted and in this embodiment

the holes 16 of the several disks are aligned. By varying the number of the holes and the positioning of the same relative to the periphery of the contact roll, contact rolls of varying degrees of face hardness or face yieldability can be readily produced.

In the embodiment of Fig. 7 the annular series of holes designated for convenience 17 and 18 are arranged with adjacent holes in overlapping relation but with the series of holes 17 closer to the periphery than the series of holes 18. This results in a somewhat less yieldable peripheral portion than in the embodiment heretofore described.

In the preferred embodiment the plies 12 are formed of fabric. However, satisfactory results may be had by forming them of certain grades of paper or felted paper stock or other fiber, or the plies may be partially of paper or felt material and partially of woven fabric.

I have illustrated and described highly satisfactory commercial embodiments of my invention. I have not attempted to illustrate or describe certain other modifications or adaptations as it is believed that this disclosure will enable those skilled in the art to embody or adapt the invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A contact roll for driven abrasive or polishing belts comprising a plurality of disks disposed and secured in side by side mutually supporting relation, each disk comprising a plurality of plies of fibrous material bound together, the intermediate disks having a series of uniformly spaced curved recesses in the peripheries thereof, the recesses of adjacent disks being staggered, the disks having an annular series of transverse holes therethrough adjacent but spaced from the peripheries thereof, the holes of adjacent disks being staggered, the annular portion at the outer side of said holes providing a peripheral portion more yielding than the portion at the inner side of the holes.

2. A contact roll for driven abrasive or polishing belts comprising a plurality of disks disposed and secured in side by side mutually supporting relation, each disk comprising a plurality of plies of fibrous material bound together, the disks having an annular series of transverse holes therethrough adjacent but spaced from the peripheries thereof, the holes of adjacent disks being staggered, the annular portion at the outer side of said holes providing a peripheral portion more yielding than the portion at the inner side of the holes.

3. In a grinding or polishing machine, the combination with a driven belt, of a contact roll coacting with said belt and comprising a plurality of plies of fibrous material disposed side by side and secured together and having a series of disconnected recesses therein, the disks having an annular series of transverse holes uniformly spaced from the periphery thereof, providing an annular peripheral rim-like portion which is relatively yieldable as compared to the portion at the inner side of the holes.

4. A contact roll for the abrading or polishing belts of grinding or polishing machines, compris-

ing a plurality of disks disposed and secured in side by side relation, each disk comprising a plurality of plies of fabric stitched together, the disks having an annular series of transverse holes therethrough adjacent to but spaced from the peripheries thereof, the holes of adjacent disks being staggered whereby the annular rim-like portion at the outer side of the holes is more yielding than the portion at the inner side of the holes.

5. A contact roll for abrading or polishing belts comprising a plurality of plies of fibrous material bound together, the periphery of the roll having a plurality of non-communicating recesses therein, there being substantial peripheral land portions between the recesses, and transverse holes adjacent the periphery of the roll providing an annular outer rim-like portion at the outer side of the holes which are relatively yielding as compared to the portion at the inner side of the holes.

6. A contact roll for abrading or polishing belts comprising a plurality of disks of fibrous material secured in side by side relation, each disk comprising a plurality of plies of fibrous material bound together, the disks having an annular series of transverse holes therethrough adjacent to but spaced from the periphery thereof, the holes of the alternating disks being at different radial distances from the periphery of the roll.

7. A contact roll for the abrading or polishing belts of grinding or polishing machines comprising a plurality of disks disposed and secured together in side by side relation, each disk comprising a plurality of plies of fibrous material secured together, the disks having annular series of transverse holes therethrough adjacent to but spaced from the peripheries thereof, the holes of alternating disks being in staggered relation relative to the periphery of the disk.

8. A contact roll for grinding and polishing belts comprising a plurality of disks of uniform diameter disposed and secured in side by side contacting and mutually supporting relation to constitute a unit, each disk comprising a plurality of plies of fibrous material bound together, the intermediate disks having a series of uniformly spaced peripheral curved bottom recesses of substantial depth extending across the peripheries of the disks, the outer disks being without such recesses, the recesses of adjacent disks being staggered with their ends in closely adjacent non-communicating relation providing a substantially uniform peripheral recessed surface between the outer disks.

9. A contact roll for the abrading or polishing belts of grinding or polishing machines, comprising a plurality of disks disposed and secured in side by side relation, each disk comprising a plurality of plies of fabric stitched together, the intermediate disks having uniformly spaced recesses in the peripheries thereof, the recesses of adjacent disks being staggered, the disks having an annular series of transverse holes therethrough adjacent to but spaced from the peripheries thereof, the holes of adjacent disks being staggered whereby the annular portion at the outer side of the holes is more yielding than the portion at the inner side of the holes.

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