

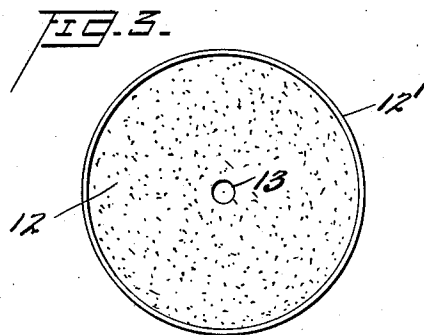
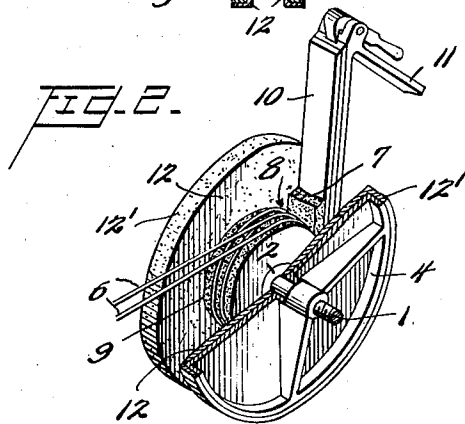
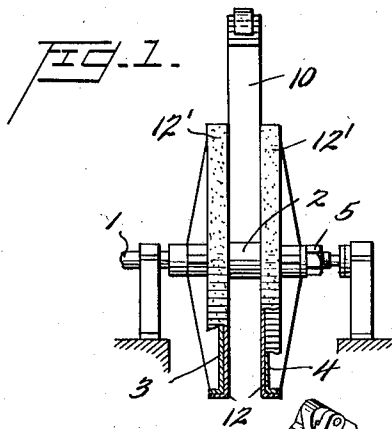
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METHOD AND APPARATUS FOR PRODUCING GRINDING WHEELS

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METHOD AND APPARATUS FOR PRODUCING GRINDING WHEELS

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6 Claims. (Cl. 51-278)

Generically this invention relates to the method and apparatus for constructing grinding and polishing wheels or stones, but it more especially is directed to the type consisting of a fibrous material, an abrasive material and an adhesive substance, and the method of forming the same into a homogenous stone-like structure, and constitutes an improvement in the subject matter of the application of Walter S. Rae, Serial Number 617,681, filed June 16, 1932, for Method and apparatus for producing grinding wheels.

In the production of composition grinding wheels or stones of the character and in the manner above stated and as described in the above referred to application, the removal of the finished wheel or stone from the shaping or forming disks is attended with considerable difficulty owing to adherence of the wheel to the disks, and therefore the principal object of this invention is the provision of means adapted to prevent such adherence, and by virtue of which said disks are readily and expeditiously removable from the finished product.

A further important object of this invention is the provision of means for preventing the adherence of the grinding wheel body to the shaping disks, even under pressure, during the formation of said body, such means comprising a flexible molded rubber mat adapted to cover the inner surface of the respective disks and prevent contact therewith of the side walls of said body.

Another object of this invention is the provision of a cushioning or resilient non-adherent element interposed intermediate the grinding body being formed and the respective pressure shaping disks to prevent the adherence of said body to said disks, said element being compressed during the body forming process, is adapted upon pressure being relieved by removal of the disks, to assume its natural form, at the same time tending to remove itself from said body and without damage to the surface thereof.

With these and other objects in view, which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawing, in which like characters of reference indicate like parts throughout the several figures, of which:

Fig. 1 is an edge view of the shaping disks partly in section, and grinding wheel body and mats in operative position.

Fig. 2 is a perspective view partly in section illustrating the manner of manufacturing a

grinding wheel and showing the non-adhesive mats operatively positioned.

Fig. 3 is a plan view of one of my improved resilient non-adherent self-removing mats.

Practice has demonstrated the difficulty in removing or separating the disks from the side walls of the grinding wheel body or stone after it has been completed, owing to the adhesive substance employed and the pressure incident to its building up process, and it was to overcome such deficiencies and to effect the ready removal of the shaping components without injury to the side surfaces of the grinding wheel, that I designed the non-adherent and cushioning mat structure, adapted to be interposed between the respective disks and grindstone body, forming the subject matter of this invention.

In the illustrated embodiment characterizing this invention there is shown a rotatable shaft 1 on which is mounted a core 2, of the desired size, and a pair of pressure disks 3 and 4, keyed or otherwise suitably secured thereon. In the present instance, disk 4 is adjustable with respect to disk 3 to accommodate different sized cores 2 and is locked in adjusted position by lock nut 5 or any suitable locking means.

The fiber strand, strands or other fibrous material 6 is suitably wound on the core 2 circumferentially thereof and from side to side and reverse in spaced and woven-like relation during the building up process, and a suitable abrasive material and an adhesive substance in the form of a mixture 7 is simultaneously delivered to the sump-like space 8 formed between the grinding wheel body 9 being formed and an interchangeable shoe 10 removably carried by the substantially triangular pressure bar frame section 11 adapted to continuously impregnate the strands 6 with the abrasive mixture 7 and embed the same into the progressive surface of said body during its building up or forming process. As this structure is shown for illustrative purposes and as the abrasive delivery means, thread feeding mechanism, and supporting and pressure control mechanism for frame 11 are fully described in the prior application Serial No. 617,681 above referred to, they are not shown.

In order to prevent the contacting surfaces of the grinding body 9 adhering to the shaping disks 3 and 4, with the consequent damage to such surfaces in effecting removal of the disks, a flexible resilient rubber element or mat 12 formed with a circumferential right angle annular flange 12' and a central opening 13 is mounted on shaft 1 adjacent each end of cone 2, said flange being

adapted to overlie and grip the respective edges and the body 12 adapted to overlie the inner surfaces of said disks against which they are maintained by core 2, when disk 4 has been locked in compressing position by lock nut 5.

While the mats 12 may be constructed without the flanges and held in position as above described, they are preferably secured by suction and the resilient annular flanges 12' adapted to grip the peripheral edges of the disks, as will be apparent without further discussion.

While I have preferably shown and referred to the employment of the core 2, it is to be understood that in some instances the said core may be omitted and the fibrous material 6 wound on the shaft 1 without affecting the use or operation of mats 12, as will be apparent.

During the forming process of the grinding wheel 9, the mats 12 will be compressed against the disks 3 and 4, and after completion of the wheel they may be readily removed, and in fact, during such removal or as soon as the compressing force is released, said mats will resume their normal form and in doing so will draw away tending to separate themselves from the adhering surfaces of the wheel, aided by the gripping action of the flanges 12' with respect to the disks, thereby completing the removal of the components of the body forming mechanism, expeditiously and without damage to or marring of the surfaces of the completed grinding wheel or stone.

As heretofore practiced, the adherence of the grinding wheel body to the inner surfaces of the pressure disks rendered the same more or less rough, so that each successive operation rendered it more difficult to effect their removal, and likewise tended to produce rough uneven side surfaces on said wheel body, which is not only entirely obviated by the employment of the mats, but which preserves the smooth finish of the disk surfaces throughout their continued use, as will be clear without further explanation.

In conclusion it will be manifest that I have not only designed a mat structure constituting an improvement in the subject matter of the application, Serial No. 617,687, but one manufacturable at a minimum of cost, far reaching in its operative effect, and at the same time effecting a saving in operating and production cost.

Although in practice I have found that the form of my invention illustrated in the accompanying drawing and referred to in the above description as the preferred embodiment, is the most efficient and practical; yet realizing the conditions concurrent with the adoption of my invention will necessarily vary, I desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts, may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having thus described my invention, what I desire protected by Letters Patent is as set forth in the following claims:

1. The process of producing a polishing and grinding wheel consisting in winding fibrous material circumferentially of the wheel, simultaneously applying an abrasive and adhesive mixture, and at the same time subjecting the side walls of the wheel to pressure applied through a yieldable intermediary.

2. The process of producing a grinding wheel consisting in winding fibrous material circumferentially of the axis of the wheel, simultaneously applying an abrasive, and at the same time subjecting the side walls of the wheel to pressure applied through an intermediary of rubber matting.

3. The process of producing a grinding wheel consisting in winding fibrous material circumferentially of the axis of the wheel, simultaneously applying an abrasive mixture, and at the same time subjecting the respective side walls of the wheel to pressure applied through a flexible molded rubber mat intermediary.

4. An apparatus for producing grinding wheels comprising a shaft, a pair of pressure disks mounted on the shaft and between which is adapted to be circumferentially wound fibrous material, means for applying an abrasive mixture to said wheel, and a flexible molded rubber mat interposed between the side walls of the wheel and the respective disks, whereby adherence of the wheel to said disks is prevented.

5. An apparatus for producing grinding wheels comprising a pair of rotatable disks, a core mounted intermediate the disks on which is adapted to be wound fibrous material to form said wheel, means for simultaneously applying an abrasive and adhesive mixture to said wheel, and a protective element interposed between the adherent side wall surfaces of the wheel and the respective disks, and tending upon removal of the disks to separate themselves from said surfaces.

6. An apparatus for producing grinding wheels comprising a pair of rotatable pressure disks, a core mounted intermediate the disks on which is adapted to be wound fibrous material to form said wheel, means for simultaneously applying an adhesive and abrasive mixture to said fibrous material and the progressive surface of the wheel during its forming process, and a substantially non-adherent protective element adapted to cover the inner surface of each disk and engage the side wall surfaces of the wheel, whereby said elements prevent adherence of the disks to the wheel and upon removal of the disks tend to separate themselves from said wheel.

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