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L. M. KUBSH

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ABRASIVE DISK AND METHOD OF MAKING IT

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FIG. 1.

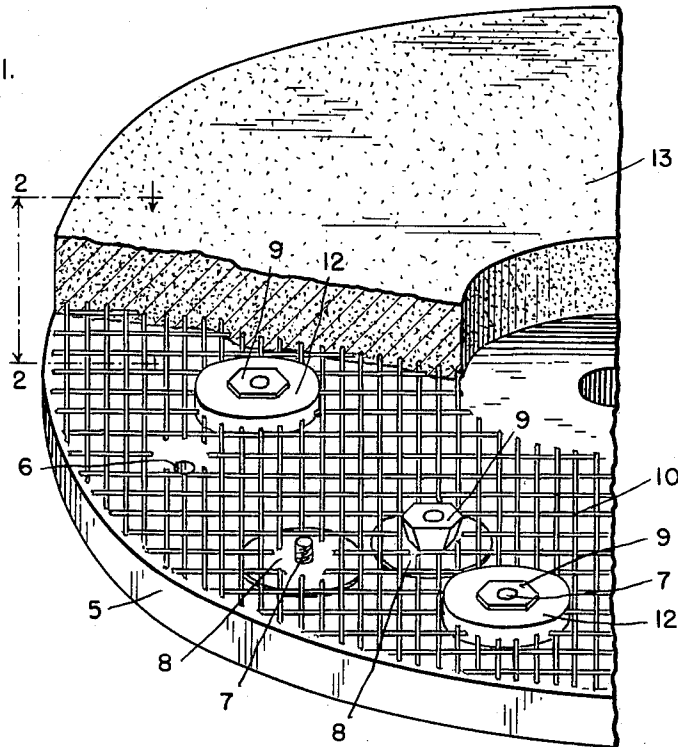
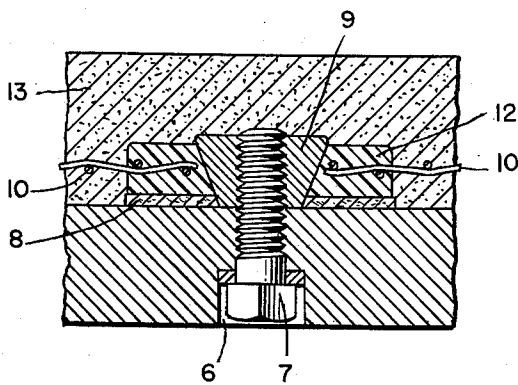


FIG. 2.

LERØY M. KUBSH
INVENTOR

BY *Marou, Pates, Miller & Stearns*

ATTORNEYS

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ABRASIVE DISK AND METHOD OF MAKING IT

Leroy M. Kubsh, Beloit, Wis., assignor to Gardner Machine Company, Beloit, Wis.

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8 Claims. (Cl. 51—209)

The specification which follows relates to an invention in reinforced abrasive wheels, particularly, those in which the flat face of the wheel constitutes the grinding surface.

Disks or wheels of this type are generally formed of synthetic, abrasive material molded and hardened into shape. Such disks are removably mounted on a steel backing plate which in turn is mounted on a rotatable spindle. It is necessary, however, to provide additional reinforcement within the body of the disk and this is customarily supplied by a woven wire fabric of relatively open mesh. It is also customary to anchor the reinforcing mesh to the nuts which are molded in the abrasive disk. The nuts provide a means of mounting the disk to the steel backing plate. When the disk is pressed into shape and subsequently hardened by baking or the like, the internal reinforcement may be bent out of its normal plane and thus placed under stress which may ultimately result, by reason of internal resilience, in either warping or cracking the abrasive mass. To prevent warping or cracking of the abrasive mass, it has been necessary to place the reinforcing mesh very close to the rear surface of the disk to keep distortion of the reinforcement to a minimum during the pressing operation.

It is the object of this invention to provide a means of placing a mesh reinforcement substantially within the body of the abrasive disk in such a manner that it will accommodate itself to the molding pressure and subsequent firing without distortion out of its normal plane.

It is a further object of this invention to provide anchorage for the reinforcing open mesh fabric in such manner that it will accommodate itself to the molding pressure and subsequent firing without distortion out of its normal plane.

It is a further object of the invention to support the reinforcing material in the mold at a substantial distance from the mold plate and independently of the mounting nuts.

A still further object of the invention is to provide means for attaching the reinforcing means to the nuts by the use of an intermediate bonding substance.

Among the objects of the invention is to provide a plastic anchorage for the reinforcing means around each mounting nut but spaced from the latter.

Other objects of the invention will be apparent from the description of the preferred form as illustrated in the accompanying drawings in which:

Fig. 1 is a fragmentary perspective view of the abrasive disk with parts broken away and

Fig. 2 is a vertical section thereof taken on the line 2—2 of Fig. 1.

Briefly considered the invention consists in providing a reinforcing open mesh fabric mounted in a plastic composition intermediate the faces of the grinding disk and loosely spaced around the anchoring nuts. The use of the plastic material for holding the reinforcing means during molding and hardening permits the fabric to expand within its plane without moving against the anchoring

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nuts and without being distorted out of its plane by the molding of the plastic abrasive material.

In the drawings a mold plate 5 is provided upon which the abrasive disk is constructed. The mold plate is provided with countersunk holes 6 uniformly spaced around the plate. Each hole is threaded to receive a temporary retaining bolt 7. The ends of the bolts 7 project above the surface of the plate 5.

A washer 8 is placed around each bolt 7 and rests upon the surface of the plate 5. This washer may be metallic, leather, textile, rubber or any similar appropriate substance.

The washer has a central opening considerably larger than the diameter of the bolt 7 so that a nut 9 may be threaded upon the bolt down to the surface of the plate 5 and thus serve to space the washer 8 in place. Each nut 9 forms a permanent part of the abrasive disk. It is used for mounting the disk and anchoring it on the appropriate backing plate of the rotary spindle. This anchoring nut is shown in the form of a truncated, six-sided pyramid. The nut is widest at its upper end.

A reinforcing member 10 is provided in the form of an open mesh wire screen with a cut-out aperture or opening opposite each bolt 7. The openings are of sufficient size so that they may be forced over the larger base of the nuts 9 and will be out of contact with the side walls of the nut.

A mass 12 of a plastic thermosetting composition or like cement is laid on the washer 8 around the nut 9 and the mass is protected by the washer from adhering to the backing plate 5 during fabrication and hardening. This plastic mass 12 is used to support the mesh fabric 10 in the position shown in Fig. 2. The plastic 12 can be inserted before the mesh 10 is applied. However, it is equally feasible to place the mesh 10 in desired position and fill the plastic mass in below and above the plane of the mesh. It is equally possible to apply the plastic in two stages. Thus, half of it may be placed on the washer 8, then the fabric 10 laid upon that and covered by a second portion of the plastic.

With the mesh 10 supported off of the face plate 5, by the plastic 12, the abrasive mass 13 is then molded in shape. Suitable pressure will serve to carry the abrasive material through the mesh fabric 10 to the upper surface of the face plate 5 and imbed the mesh 10 in the plastic 12. The mass completely surrounds the plastic 12 and the nut 9 with a considerable body of composition above the latter. In practice some of the plastic 12, diffuses into the abrasive mass 13 to provide an integral bond between the two in the subsequent curing operation. Because the mesh reinforcing 10 isn't rigidly fastened to the nut 9 to be supported substantially off of the face plate 5, it is free to locate itself in the abrasive mass 13 without distorting during the molding operation.

The abrasive disk thus formed is hardened by drying heat, baking, firing or other suitable operation. The hardening process also hardens plastic 12 to anchor the mesh 10 to each nut 19. In the course of hardening the disk, any linear expansion of the wires or other strands in the mesh will be accommodated without bringing them into contact with the anchoring nuts.

As a consequence the completed disk has a reinforcing molded fabric free from stress and not likely to warp or crack the abrasive mass.

The plastic mass 12 after curing by drying or high temperature is hardened sufficiently to form a fixed attachment between the reinforcing mesh 10 and the nuts 9.

While the preferred form of the invention and mode of production has been illustrated and described by way of example, the scope of the invention is believed to be subject to minor changes and variations in materials, pro-

portions and minor details of manufacture without departing from the scope of the invention as defined in the following claims.

What I claim is:

1. The method of making reinforced abrasive disks which comprises temporarily holding anchor nuts in spaced relationship, surrounding each nut with a mass of thermosetting cement in plastic state, supporting a wire mesh fabric in said plastic mass in spaced relation expansively around said nuts, embedding said nuts and fabric in a mass of fluent abrasive composition and simultaneously hardening the plastic and abrasive masses.

2. The method of making reinforced abrasive disks which comprises temporarily holding anchor nuts in spaced relationship, surrounding each nut with a mass of thermosetting cement in plastic state, supporting a wire mesh fabric in said plastic mass in spaced relation expansively around said nuts, embedding said nuts and fabric in a mass of fluent abrasive composition compressing said masses transversely inwardly and simultaneously hardening the plastic and abrasive masses.

3. The method of making reinforced abrasive disks which comprises temporarily holding anchor nuts in spaced relationship, surrounding each nut with a mass of thermosetting cement in plastic state, supporting a wire mesh fabric in said plastic mass in spaced relation expansively around said nuts, embedding said nuts and fabric in a mass of fluent abrasive composition compressing said masses transversely inwardly, and simultaneously heat hardening the plastic and abrasive masses.

4. The method of making reinforced abrasive disks having spaced mounting nuts which consists in surrounding each mounting nut with a thermosetting plastic mass, supporting a reinforcing wire mesh fabric on said plastic mass in loose spaced relation to each nut, covering the fabric with a fluent abrasive mass to form a disk and compressing to cause the fabric to become embedded within the plastic mass and simultaneously hardening the disk.

5. A reinforced abrasive disk having a body of hardened abrasive material, a plurality of spaced anchor nuts in said body, a mass of plastic cement surrounding each nut and an apertured wire mesh fabric embedded in both the body and cement masses with the edges of the fabric apertures expansively spaced within the plastic masses and from the said nuts.

6. A reinforced abrasive disk having a body of hardened abrasive material, a plurality of spaced anchor nuts in said body, a mass of plastic cement surrounding each nut and an apertured flat wire mesh fabric embedded in both the body and cement masses with the edges of the fabric apertures expansively spaced within the plastic masses and from the said nuts.

7. A reinforced abrasive disk having a body of hardened abrasive material, a plurality of spaced anchor nuts in said body, a washer around each nut in the rear surface of the disk, a mass of plastic cement surrounding each nut in front of the washer, and an apertured flat wire mesh fabric embedded in the abrasive body with the peripheries of its apertures expansively held in the plastic masses spaced from said nuts and in front of said washers.

8. The method of making reinforced abrasive disks which consists in supporting a reinforcing wire mesh in a mold at suitable points on a yielding mass of thermosetting material in the plastic state, surrounding said reinforcing mesh and supporting material with a fluent abrasive, subjecting said abrasive to pressure to which the reinforcing mesh yields, and simultaneously curing said abrasive and heat-hardening said plastic.

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