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ABRASIVE ASSEMBLY FOR POLISHING FLAT SURFACES

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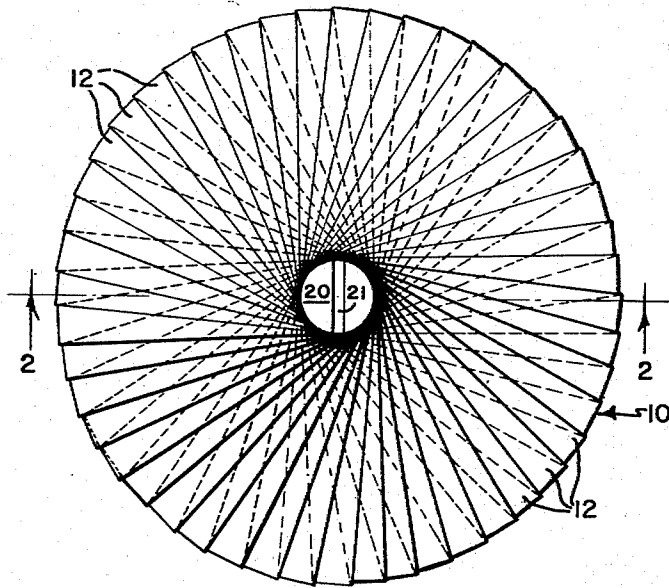


FIG.-1-

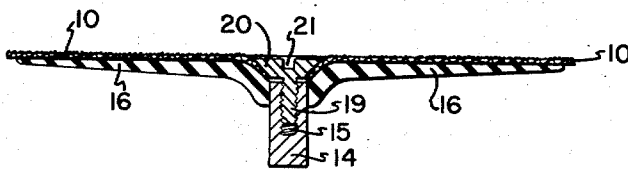


FIG.-2-

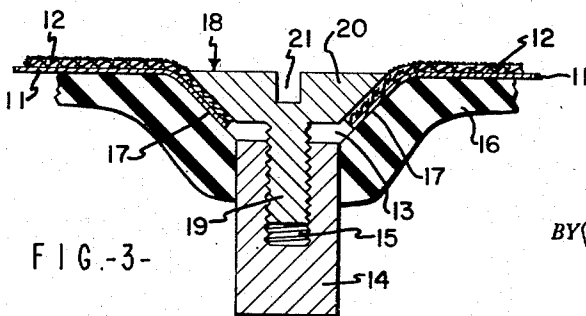


FIG.-3-

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ABRASIVE ASSEMBLY FOR POLISHING FLAT SURFACES

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7 Claims. (Cl. 51—197)

This invention relates to an abrasive assembly for polishing flat surfaces, such assembly including an abrasive disc and means for rotatably mounting the same.

It is an object of my invention to provide an abrasive device for light grinding and polishing purposes which utilizes an easily replaceable disc which is simply and economically manufactured of discardable materials. It is particularly an object of my invention to provide such a disc which comprises a replaceable unit which may be quickly and easily removed from the rotatable mounting means and replaced with a fresh unit when it has become worn. Toward this end, it is a further object of my invention to provide a rotatable mounting means for such a disc which permits and provides simple and rapid replacement of the abrasive disc.

Another object of my invention is to provide an abrasive disc of the type described in which fresh abrasive material becomes available for use as the old abrasive material is used and worn away, thus extending the life of the disc and providing improved and substantially uniform abrasive action throughout the life of the disc.

It is a further object of my invention to provide such a disc and mounting means which are substantially rigid, but are nevertheless sufficiently flexible to permit the disc to follow the contours or slight irregularities of the flat surface which is being polished.

In essence, my invention contemplates providing an abrasive disc which is formed around a central disc-shaped bare member, which preferably comprises a flat disc of substantially rigid but economical material such as cardboard or the like. Mounted upon the entire surface of one side of the base member are a plurality of strips of cloth or paper which are coated with suitable abrasive material on the outer side thereof. The abrasive strips extend radially with respect to the base member and are adhered thereto. The abrasive strips are disposed in a continuously overlapping relationship so that as the edge of each strip becomes worn away, it exposes the fresh abrasive material on the strip disposed therebeneath. The disc is sufficiently rigid to permit it to be easily handled and replaced as a unit. It may be discarded when worn out, without loss of valuable parts or materials.

My abrasive disc is adapted to be removably mounted on a rotatable member which includes a somewhat flexible circular supporting member. My abrasive disc fits upon the top of the supporting member, which is depressed adjacent a centrally disposed opening. A wedge-shaped holding member is mounted so that it fits within the depression, with its angular sides clamping the inner end of each of the strips between it and the supporting member to prevent separation of the strips from the disc upon high speed rotational use of the disc for polishing purposes.

It is accordingly an object of my invention to provide an abrasive assembly having the advantages of the structure set forth. My invention also comprises such other objects, advantages and capabilities as will later more

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fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred embodiment of my invention, it should be understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings,

Fig. 1 is a top plan view of my abrasive assembly;

Fig. 2 is a sectional view of the same taken on line

2—2 of Fig. 1;

Fig. 3 is an enlarged view of the central portion of Fig. 2.

A preferred embodiment which has been selected to illustrate my invention comprises an abrasive disc 10, which is formed around a central circular base member 11, which preferably comprises a flat disc-shaped piece of substantially rigid but economical material such as a piece of cardboard or the like. The radius of the base member 11 may be varied in accordance with the size of the material being polished.

A plurality of small substantially rectangular abrasive strips 12 are adhered to one surface of base member 11. The abrasive strips 12 extend radially with respect to base member 11 around its entire surface. The abrasive strips 12 are preferably cut from cloth or paper which is coated with suitable abrasive material on one side thereof, the other side being plain. The plain side of each of the strips 12 is adhered to the side of the base member 11 with a suitable adhesive such as vinyl glue or the like. The strips 12 are arranged so that each strip overlaps the adjacent strip a substantial amount, but is not glued thereto, the amount of overlapping being variable.

It should be noted that a sufficient number of strips 12 should be provided so that the exposed portion of each strip is substantially small in area. If the exposed area is too large, the abrasive material will wear off the outside of the strip, leaving smooth paper or cloth exposed. If the exposed area is smaller, the edge of each of the strips 12 strikes the material being polished and the strip wears away, with the wear extending inwardly from the edge to expose fresh abrasive material therebeneath. With a large number of strips, the total area thus worn away is considerably greater than if a small number of strips were used.

In use, my disc 10 is provided with a central circular opening 13 through which it is mounted on a rotatable member which comprises an elongated shaft 14 with an internally screwthreaded opening 15 in one end thereof. The other end of the shaft 14 is adapted to be attached to a suitable source of rotation. A disc-shaped supporting member 16 is preferably formed of substantially rigid but still somewhat flexible material such as rubber or the like. The supporting member 16 is bonded to the outside of the shaft 14. Supporting member 16 is provided with a circular depression which surrounds shaft 14, as best shown in Fig. 3 of the drawings. As a result, the supporting member 16 has walls 17 which are inclined angularly upwardly with respect to the top of shaft 14.

My abrasive disc 10 is placed on top of supporting member 16 so that its opening 13 is aligned with shaft 14. A holding member 18 having a screwthreaded shank 19 and a wedge-shaped head 20 is mounted so that its shank 19 fits within the opening 15 in shaft 14. The head 20 of holding member 18 is provided with a transverse slot 21 to accommodate the blade of a screw driver.

The diameter of the opening 13 in disc 10 is preferably substantially the same as the diameter of shaft 14 and the diameter of the bottom of the head 20 of holding member 18. The diameter of the top of holding member 18 is substantially equal to that of the depression adjacent the center of the supporting member 16. The result is

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that as the holding member 16 is moved toward the shaft 14, its side walls 17 grip and hold the portion of disc 10 adjacent opening 13 against the walls 17 of supporting member 16.

It will be noted that the entire inner end of each of the abrasive strips 12 is thus held firmly against displacement from the disc 10 when the disc 10 is subjected to high speed rotational use. This action is important to the operation of my invention, since the adhesive alone may not be sufficient to hold the strips 12 on the base member 11. The pressure of the head 20 reinforces the adhesive and prevents the strips 12 from being loosened from the base member 11 during the high speed rotation necessary to use the disc for grinding and polishing purposes.

The head 20 of the holding member 16 fits within the depressed area of the supporting member 16 so that it is disposed slightly beneath the surface of the disc 10 and will not interfere with the polishing action.

In use, the disc 10 and supporting member 16 are substantially rigid, so that they perform the desired abrasive and polishing action. At the same time, however, they are formed of somewhat resilient cardboard and rubber respectively, so that they have a sufficient amount of resilience to follow and polish the contours and irregularities which occur in a substantially but not perfectly flat surface.

It will be noted that with the construction set forth, each of the abrasive strips 12 need be glued only to the base member 11 and not to the strips disposed therebeneath. This amount of gluing, together with the reinforcement provided by the holding member 18, is sufficient to prevent separation of the strips 12 from the base member 11. As a result, it is possible to form my abrasive disc in an extremely simple and economical manner by coating the base member 11 with adhesive and then adhering the strips 12 thereto and/or by forming the strips 12 in overlying radial relationship to each other and then applying adhesive material to the exposed surfaces thereof. It will be noted that the separate gluing of each individual strip 12 can thus be avoided.

I claim:

1. An abrasive disc comprising a flat disc-shaped base member formed of a substantially rigid piece of cardboard, a plurality of small elongated rectangular abrasive strips adhered to one side of said core member around the entire surface thereof, said strips extending radially with respect to said base member, each of said strips having abrasive material on the exposed side thereof, said strips being disposed in substantially overlapping relationship to each other, the overlapping portions of said strips being held flat upon the adjacent strip in substantially the same plane as said base member, said disc having a centrally disposed circular opening, the inner end of each of said discs extending to adjacent said opening, there being a sufficient number of said strips so that each strip has an exposed edge adapted to wear away in use to expose the abrasive portion of the adjacent strip disposed therebeneath.

2. The structure set forth in claim 1, said disc being

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somewhat resilient so that it is adapted to follow the contours and irregularities of the surface being polished.

3. The structure set forth in claim 1 and rotatable mounting means for said disc comprising a shaft, a substantially disc-shaped supporting member formed of substantially rigid but somewhat resilient material, said supporting member being attached to and surrounding said shaft, said supporting member having a depressed area adjacent the center thereof surrounding said shaft, said shaft having a screwthreaded opening in the upper part thereof, a holding member having a screwthreaded shank and a wedge-shaped head, said abrasive disc adapted to be mounted overlying said supporting member with the central opening in said disc aligned with the screwthreaded opening in said shaft, said holding member adapted to be screwthreadedly mounted in the opening in said shaft so that the head of said holding member fits within the depressed area of said supporting member, with the inner end of each of the abrasive strips being held within said depressed area between the head of said holding member and said supporting member.

4. The structure set forth in claim 3, the sides of the wedge-shaped head of said holding member and the walls of the depressed area of said supporting member extending substantially parallel to each other, with the central portion of said abrasive disc being disposed therebetween.

5. An abrasive disc comprising a substantially rigid disc-shaped base member, a plurality of abrasive strips adhered to one side of said base member around the entire surface thereof, said strips extending radially with respect to said base member, each of said strips having abrasive material on the exposed side thereof, said strips being disposed in overlying relationship to each other, the overlapping portions of said strips being held flat open the adjacent strip in substantially the same plane as said base member, the inner end of each of said strips extending to adjacent the center of said disc.

6. The structure set forth in claim 5 and means for mounting said abrasive disc for high speed rotation, said mounting means including a disc-shaped supporting member having a depressed area adjacent the center thereof, a substantially wedge-shaped holding member adapted to fit within said depressed area, said holding member adapted to extend through said abrasive disc adjacent the center thereof and hold the inner end of each of said strips against said supporting member.

7. The structure set forth in claim 6, said abrasive disc and supporting member being somewhat resilient and adapted to follow the irregularities of the surface being ground.

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