Sept. 3, 1957 A. BLOCK 2,804,730

REPLACEABLE FLEXIBLE ABRASIVE UNIT FOR POLISHING SHEETS AND PANELS

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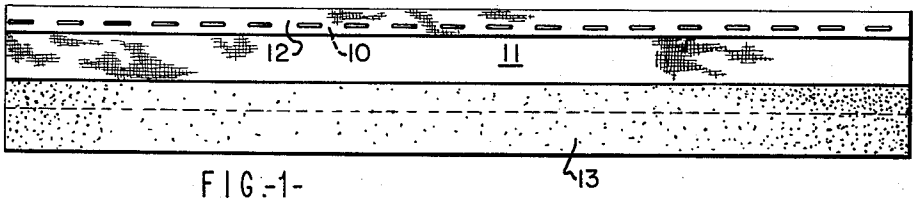


FIG.-1-

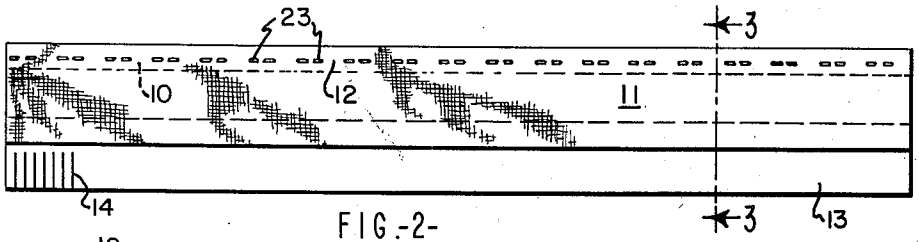


FIG.-2-



FIG.-3-

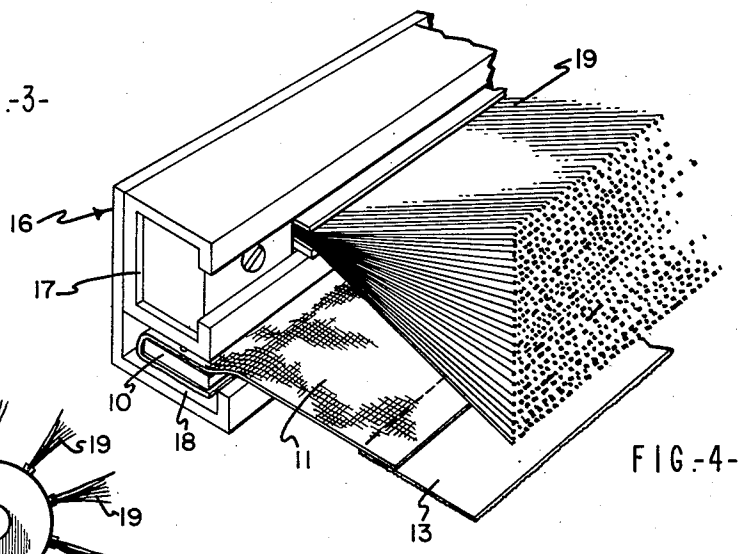


FIG.-4-

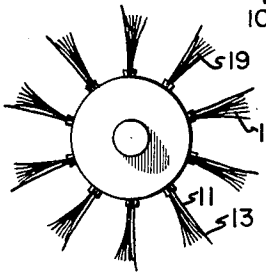


FIG.-5-

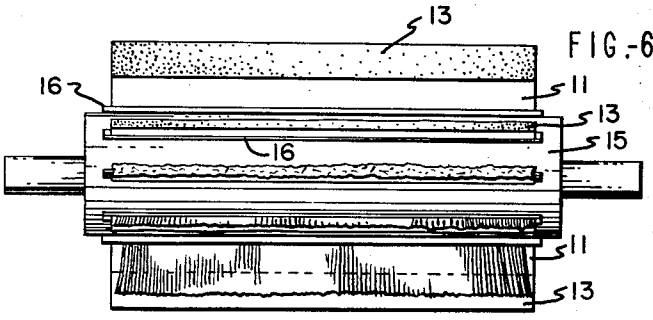


FIG.-6-

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REPLACEABLE FLEXIBLE ABRASIVE UNIT FOR POLISHING SHEETS AND PANELS

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2 Claims. (Cl. 51—193.5)

This invention relates to a flexible abrasive unit which is replaceable and which is adapted for use in polishing sheets and panels.

My flexible abrasive unit is particularly designed for use in connection with a large drum for polishing sheets and panels of considerable size. My unit is, however, capable of use in the same or in suitably modified form in other devices and constructions for the same or other abrasive purposes.

It is an object of my invention to provide a replacement unit which may be simply and quickly installed upon and removed from a drum or rotatable member of considerable length and which can preferably be inserted and removed from one end of the drum. Since my abrasive unit extends along substantially the entire length of the drum, it must necessarily possess a certain amount of rigidity in order to permit such insertion.

It is a further object of my invention to provide an abrasive unit which is capable of use in association with an adjacent brush, with the brush gently wiping the abrasive material into contact with the surface area of the sheet or panel being polished. My abrasive unit must accordingly possess a considerable amount of flexibility, preferably greater than that of a conventional sheet of abrasive coated paper.

Another object of my invention is to provide a replaceable abrasive unit which is simple in construction and economical in cost. My abrasive unit is formed of the most economical materials which are assembled in as simple and economical a manner as possible.

Another object of my invention is to provide an abrasive unit of the class described which can be mounted on and removed from a rotatable member from the outside thereof without requiring disassembly of the rotatable member and without requiring moving parts or adjustments of any kind.

In essence, my invention contemplates a replaceable flexible abrasive unit for polishing large areas, said abrasive unit having a substantially rigid base member. An elongated band of substantially flexible material such as textile or the like which is substantially equal in length to the base member is attached thereto along one edge. An elongated band of abrasive material substantially equal in length to the base member is attached to the opposite edge of the flexible band. The opposite edge of the abrasive band is free and contacts the material being polished. This provides a unit which possesses the desired combination of rigidity, flexibility and economy, as will be more clearly set forth later in this application.

My invention also comprises such other objects, advantages and capabilities as will later more 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 plan view of one side of my unit;

Fig. 2 is a plan view of the opposite side;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is an end perspective view of a track showing my unit in use therein;

Fig. 5 is an end view of an abrasive drum showing my unit in use therein;

Fig. 6 is a side view of an abrasive drum showing my unit in use therein.

A preferred embodiment which has been selected to illustrate my invention comprises an elongated base member **10**, which is preferably formed of substantially rigid material. The word "rigid" is used in the sense that the material is substantially self-supporting so that it can be inserted into an elongated track without buckling or otherwise resisting such insertion. Base member **10** preferably comprises a flat, narrow strip of cardboard, this material being the best available substance which provides the desired degree of rigidity together with economy. Other suitable materials such as plastics might also be used if their physical properties were satisfactory and their cost not exorbitant.

An elongated flat flexible band **11** of substantially flexible material is substantially equal in length to base member **10**. The term "substantially flexible" is used in contrast to the "rigid" base member and means that the material is not rigid and is preferably more flexible than the base member **10** and more flexible than conventional abrasive coated paper. Flexible band **11** is preferably formed of textile material, although other suitable materials such as equivalent plastics and other substances may also be used.

One edge of flexible band **11** is bent to form a loop **12**, which extends around base member **10**. A plurality of staples **23** extend through both sides of loop **12** and through base member **10** along the entire length thereof to attach one edge of flexible band **11** securely to base member **10**.

An elongated abrasive band **13** is substantially equal in length to base member **10** and flexible band **11**. Abrasive band **13** is preferably formed of paper or other suitable material which is coated on one side thereof with a plurality of small abrasive particles of the type suitable for the particular abrasive or polishing use. One edge of abrasive band **13** is attached to the other edge of flexible band **11** along the entire length thereof. The means of attachment used preferably comprises applying vinyl glue or other suitable liquid adhesive between one side of the edge of flexible band **11** and the back edge of abrasive band **13**. It is also possible to use adhesive to attach flexible band **11** to base member **10** and both assembly operations might be performed at the same time to reduce manufacturing costs.

The opposite edge of abrasive band **13** is left free and is adapted to engage the surface of the sheet or panel to perform the polishing operation. The free edge of abrasive band **13** may be left intact or may be provided with a plurality of transverse scores **14**, which are preferably evenly spaced along the entire free edge of abrasive band **13**. The advantage of scores **14** is that they provide a plurality of adjacent portions of abrasive material which are free to move relatively independently from each other. In case the material being polished has high or low spots or other irregularities, one or more portions of abrasive material can move into or around such high or low spots without affecting the action of the adjacent portions of abrasive or adversely affecting the polishing of adjacent areas of the material being polished.

My replaceable abrasive unit is particularly adapted for use in an abrasive assembly for polishing flat sheets, plates and panels. Such assembly may comprise a hollow cylin-

drical drum **15**, which is rotatably mounted with respect to the material being polished. The drum has mounted along the entire outside thereof a plurality of tracks **16** which extend along substantially the entire length of drum **15** and are evenly spaced therearound. Each track **16** actually comprises a pair of adjacent channels, one being a brush channels **17** and the other an abrasive channel **18**. The brush channel **17** is substantially square in shape, with an opening along the center of the top edge thereof. A brush **19** is mounted in brush channel **17** by sliding it into the end of the channel. The base of brush **19** is held therein because it is larger than the opening in the top of brush channel **17**.

My replaceable abrasive unit is adapted to be inserted into the end of abrasive channel **18** and slid along the channel until it extends substantially from one end of drum **15** to the other. Base member **10** provides sufficient rigidity for my unit so that the unit may be made in substantially any length for substantially any size of drum. Base member **10** acts to prevent any buckling or binding of the unit during insertion and permits easy and quick replacement of the abrasive unit with access to only one end of drum **15**.

Base member **10** corresponds to the shape of abrasive channel **18** and is securely held therein, with flexible band **11** curving around the top edge of abrasive channel **18** and extending adjacent the lower portion of brush **19**. The abrasive band **13** is disposed adjacent the ends of the bristles of brush **19**.

It will be noted that in my abrasive unit the abrasive material is provided only adjacent the free bristle ends of the brush **19**. This abrasive material is brushed or wiped against the surface being polished and becomes worn, requiring replacement. In the past, this replacement has often been accomplished from the interior of a rotatable member by feeding out a length of abrasive. With my unit, however, the replacement is accomplished more easily and qiuckly from the exterior of the rotatable member.

In use, the portion of the abrasive unit between the edge of abrasive band **13** and track **16** does not contact the material being polished and will not become worn. The use of a flexible band **11** thus avoids wasting expensive abrasive material, the cost of a textile band being approximately half the cost of a comparable piece of abrasive material.

My construction further assures replacement by the user at the proper time. If a large area of intact abrasive were left in the lower half of the replaceable abrasive unit, the user might through error or through fale economy think that the unit need not be replaced, even though the abrasive material had been completely worn from the end of the unit. With my construction, the need for replacement can easily be observed by the user and there is no hesitancy about wasting unused abrasive material.

It should also be noted that the flexible band **11** is preferably more flexible than the sheet of paper which forms abrasive band **13**. This means that the entire abrasive unit is more flexible and can respond more readily to surface variations in the material being polished. The presence of flexible band **11** provides flexibility along the entire length of the abrasive unit, so that different parts thereof can move with respect to one another to fit the contours of the material being polished. In use, this permits my abrasive unit to be used in polishing material having a radius or having variations from a completely flat surface. Such material could not properly be reached and polished by an inflexible abrasive unit.

My replaceable abrasive unit thus provides a unique and desirable combination of rigidity for easy loading and replacement, flexibility for increased range of polishing action, and economy resulting from the use of a minimum amout of abrasive material.

I claim:

1. A replaceable flexible abrasive unit for polishing large areas comprising an elongated narrow base member formed of cardboard or the like, an elongated flat flexible band of textile material substantially equal in length to said base member, said flexible band being attached along one edge thereof to said base member by a plurality of staples extending along the entire length of said base member, and an elongated flat band of abrasive material substantially equal in length to said base member, said abrasive material being attached along one edge thereof to the opposite edge of said flexible band by adhesive extending along the entire length of said bands, the opposite edge of said abrasive material being free.

2. A replaceable flexible abrasive unit for polishing large areas comprising an elongated narrow base member formed of cardboard or the like, an elongated flat flexible band of textile material substantially equal in length to said base member, one edge of said flexible band forming a loop extending around said base member, a plurality of staples extending through and attaching both sides of said loop of textile material to said base member, said staples extending along the entire length of said base member, and an elongated flat band of abrasive material substantially equal in length to said base member, said abrasive band being attached along one edge thereof to the opposite edge of said flexible band by adhesive extending along the entire length of said bands, the opposite edge of said abrasive band being free.

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