Feb. 2, 1943. J. P. FENTON 2,309,836

ABRASIVE ARTICLE

Filed Nov. 26, 1941

Fig. 1

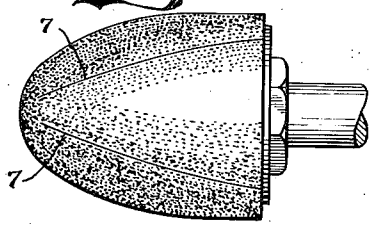


Fig. 2

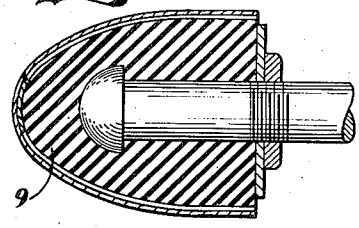


Fig. 3

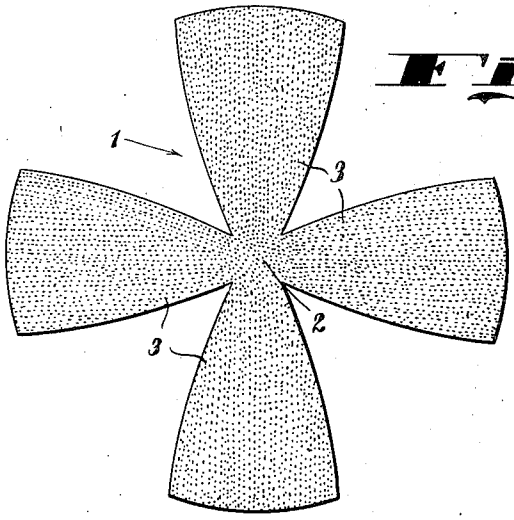


Fig. 4

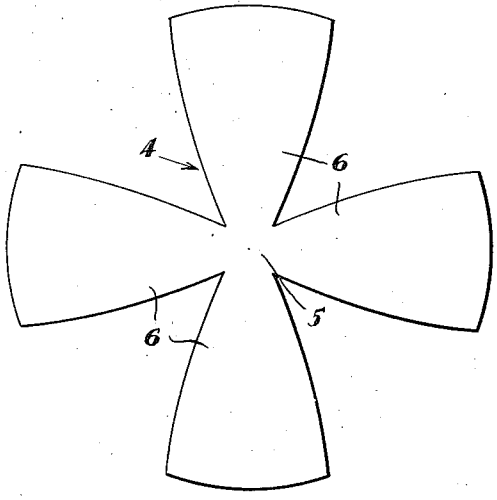
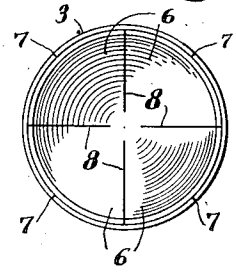


Fig. 5



Inventor

John P. Fenton

By John A. P. Hayes

Attorney

Patented Feb. 2, 1943

2,309,836

UNITED STATES PATENT OFFICE

2,309,836

ABRASIVE ARTICLE

John P. Fenton, Boston, Mass., assignor to American Sandpaper Company, a corporation of Massachusetts

Application November 26, 1941, Serial No. 420,549

1 Claim. (Cl. 51—185)

The invention relates to an abrasive article like that covered by my Letters Patent No. 2,282,650 of May 12, 1942.

The object of the present invention is to simplify the construction and increase the working life of the abrasive article covered by said patent, and is especially directed to the interior structure of the article, the present invention constituting an improvement to the interior structure of the article as shown in said patent.

The invention can best be seen and understood by reference to the drawing in which

Fig. 1 is a side elevation of the abrasive article mounted upon a mandrel.

Fig. 2 is a longitudinal section of what is shown in Fig. 1.

Fig. 3 is a plan of the abrasive material which forms the exterior portion of the abrasive article after the material has been cut or died out from a blank, and prior to its being formed, or molded, into the shape it assumes in the completed article.

Fig. 4 is a plan of that which will later be referred to as the interior portion of the abrasive article after it has been cut or died out from a blank, and prior to its being formed, or molded, in association with the exterior portion, as shown in Fig. 3, into the shape it assumes in the completed article.

Fig. 5 is a rear end elevation of the abrasive article, as shown in Fig. 1, with the mandrel removed.

Referring to the drawing 1 represents the exterior abrasive carrying portion of the article. This exterior portion comprises various parts including a disk 2. This disk is a generally round relatively flat disk, though preferably made slightly convexed. It forms the fore end of the abrasive article and is located centrally with relation to its axis. Extending from this disk are arms 3. These arms extend from all around the edge of the disk, first with an outward broad convexity which gives to the fore end portion of the abrasive article its general convex form and vaulted interior, and then after the arms have reached a point where they impart to the article its full diametric sides, the arms extend substantially parallel with the axis of the article. The disk and arms are cut or died from a blank or sheet of a flexible coated abrasive material, preferably such as a strong but flexible abrasive cloth, or coated abrasive which has a cloth backing. When cut or died out the disk and arms have the same general form, in the flat, as shown in Fig. 3, where it will be seen that the arms radiate from the central disk.

Associated with the exterior portion 1 of the abrasive article thus provided is an interior portion 4. This interior portion is in form substantially like the outer portion 1. It comprises an end disk 5 with outwardly radiating arms 6, and in the cut blank has substantially the form shown in Fig. 4. Its material is preferably a strong, relatively stiff, though flexible, paper, capable of performing the functions for which it is designed to be used and which include, as will presently be explained, a backing to the convexed arms 3 of the outer portion 1 of the article, and also such co-operation with these arms as will enable the arms 6 of the interior portion 4 to form a ring or sleeve against which an inside mandrel may be expanded for holding the abrasive article in place for purpose of rotation.

The exterior and interior portions 1 and 4 of the abrasive article are adhesively secured to each other. After the application of the adhesive the respective portions are superimposed upon one another and fashioned by a die to give form to the abrasive article. In the completed article the disposition of the arms, in the respective exterior and interior portions of the article, is such that the lines between the arms of the respective portions of the formed article, meaning the lines 7, between the arms 3 of the exterior portion 1 of the article, and the lines 8, between the arms 6 of the interior portion 4 of the article, will lie relatively offset with relation to each other. The preferred arrangement is one in which the lines 8 between the arms 6 of the interior portion will bisect the arms 3 of the exterior portion; the arms 3 then overlapping the arms 6 (see Fig. 5). The arms 6 will then collectively provide a lining, reinforcing and stiffening the outer arms 3 in those portions thereof which give convexity to the abrasive article and which form the essential working portion thereof. As the combined sets of arms are brought in by the die to extend more parallel with the axis of the abrasive article, the arms 6 will be brought into the general form of a tubular ring or sleeve, and this form maintained by those portions of the outer arms 3 adhesively secured to them. Thus an internal tubular ring or sleeve is provided against which the mandrel may be expanded for holding the abrasive article for purpose of rotation.

The arms 3 of the outer abrasive carrying portion of the article are preferably brought together along their meeting edges into snug abut-

ment in order to leave as continuous a surface as possible, with no open edges that might be disrupted when brought into contact with some part of the surface worked upon. The edges between the arms are securely held down by their adhesion to the arms of the interior portion 4, or lining lying beneath them. This also prevents disruption of the edges during the operation of the tool.

The arms of the interior portion 4 are also preferably so made to meet along their edges, not only in order that they may provide as wide a bearing as possible for the support of the outer set of abrasive carrying arms, but also that the ring or sleeve formed by them will be continuous and present as wide a surface as possible to which the outer arms may be adhesively secured, thus enabling the ring or sleeve to maintain its integrity. The inner arms in the portions thereof, which form the interior ring or sleeve, are preferably so made as not to overlap in order to avoid any high or low spots in the abrasive carrying arms of the outer portion secured to them.

The abrasive article is mounted for rotation by mounting upon an expansible mandrel 9 which is expanded against the ring, or sleeve, of the abrasive article.

I claim:

In an abrasive article having an exterior portion of abrasive material fashioned to comprise an end piece with arms projecting from it and which arms are convexed in part and with a general tubular extension from the part of their convexity, an interior portion to an abrasive article having an exterior portion formed as aforesaid, said interior portion comprising an end piece with arms projecting from it and which arms are convexed in part and with a general tubular extension from the part of their convexity, the end piece of the interior portion lining the end piece of the exterior portion and adhesively secured thereto, the convexed part of the arms of the interior portion lining the convexed part of the arms of the exterior portion and adhesively secured thereto, and the tubular extension to the arms of the interior portion lining the tubular extension to the arms of the exterior portion and adhesively secured thereto, the adjacent edges between the arms of said respective portions being offset with relation to each other, said tubular extension to the arms of the interior portion providing an internal sleeve against which an interior mandrel may be expanded for holding the abrasive article in place during its rotation.

JOHN P. FENTON.