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2,528,183

METHOD OF MAKING ABRASIVE PADS

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FIG. 1

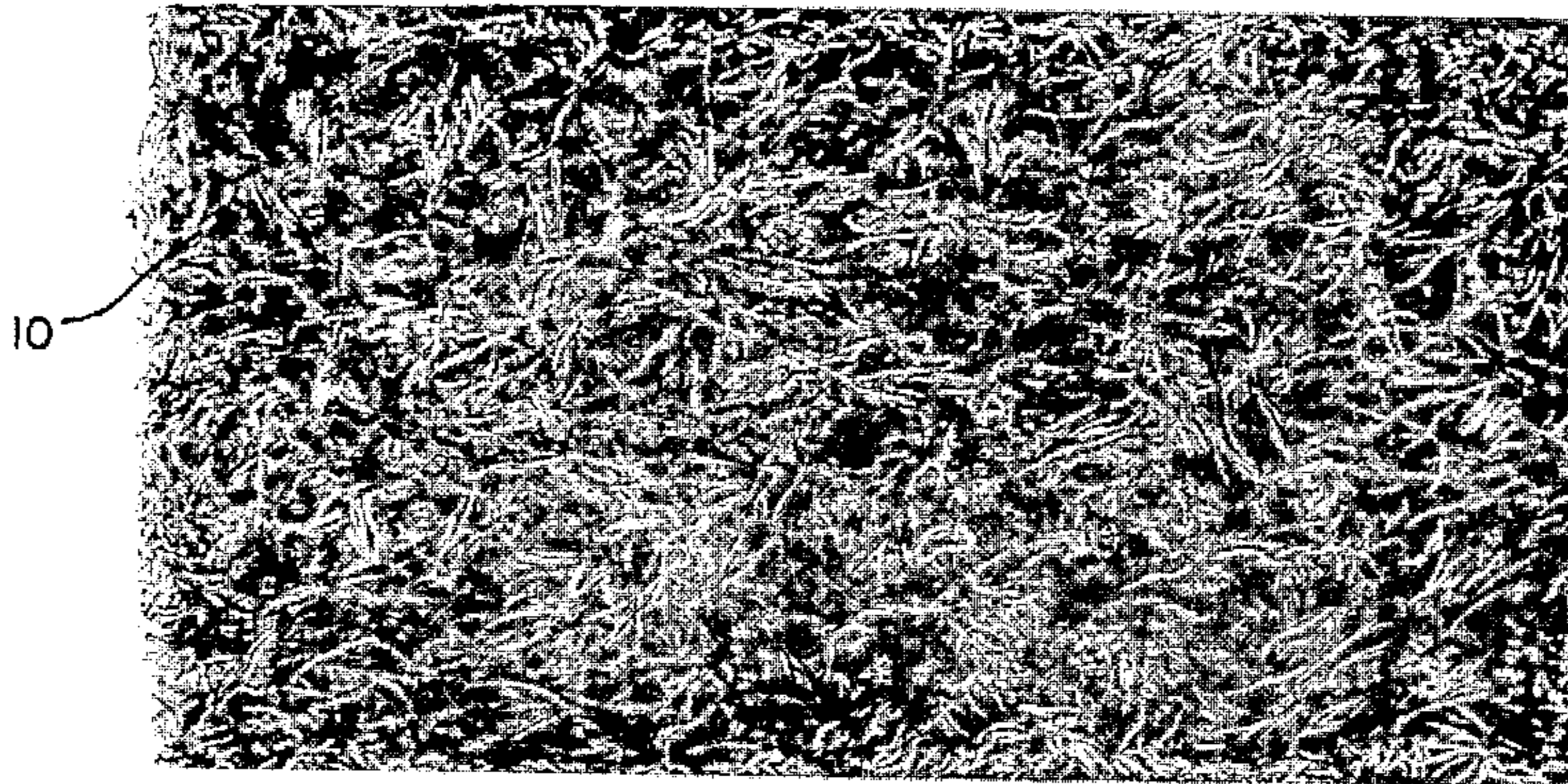


FIG. 2

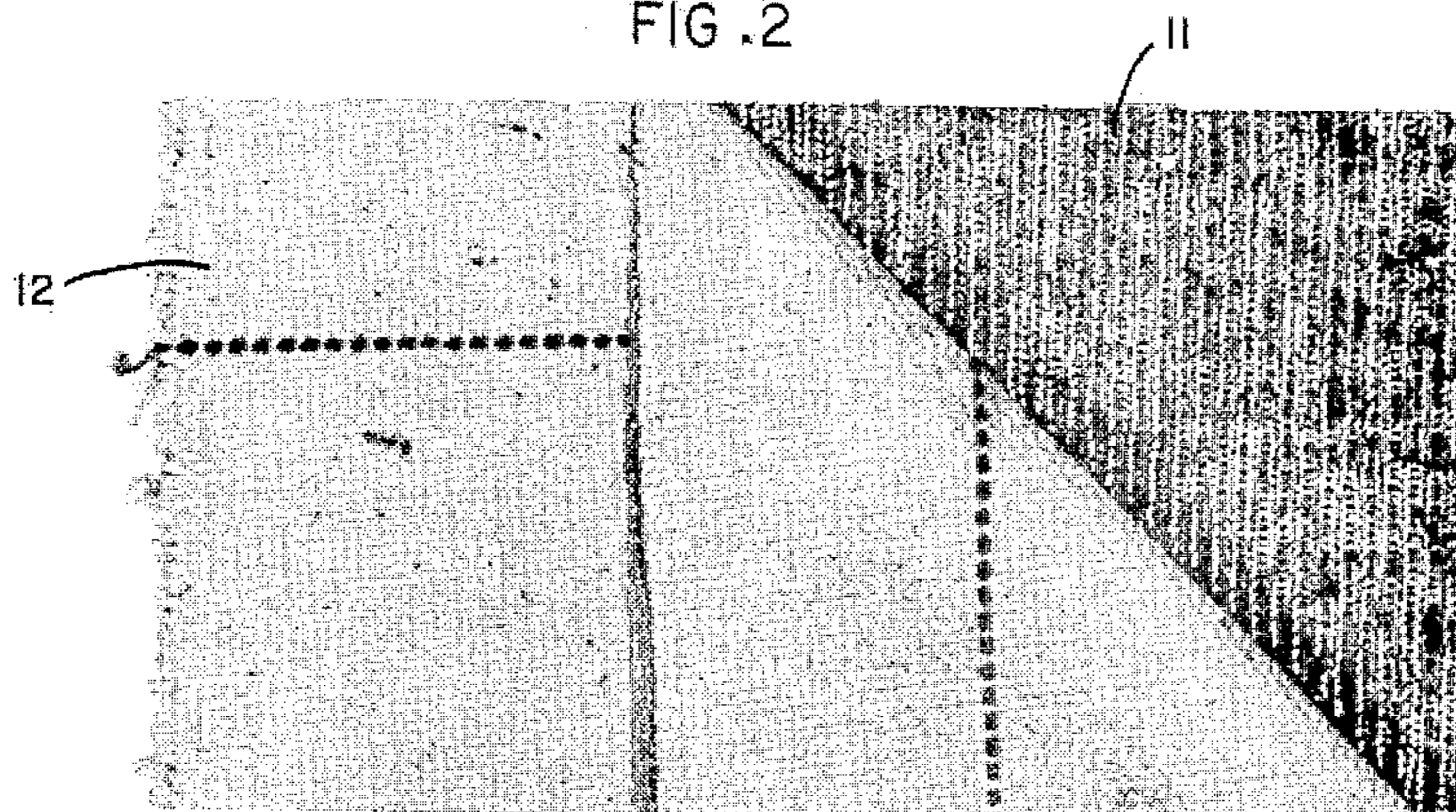
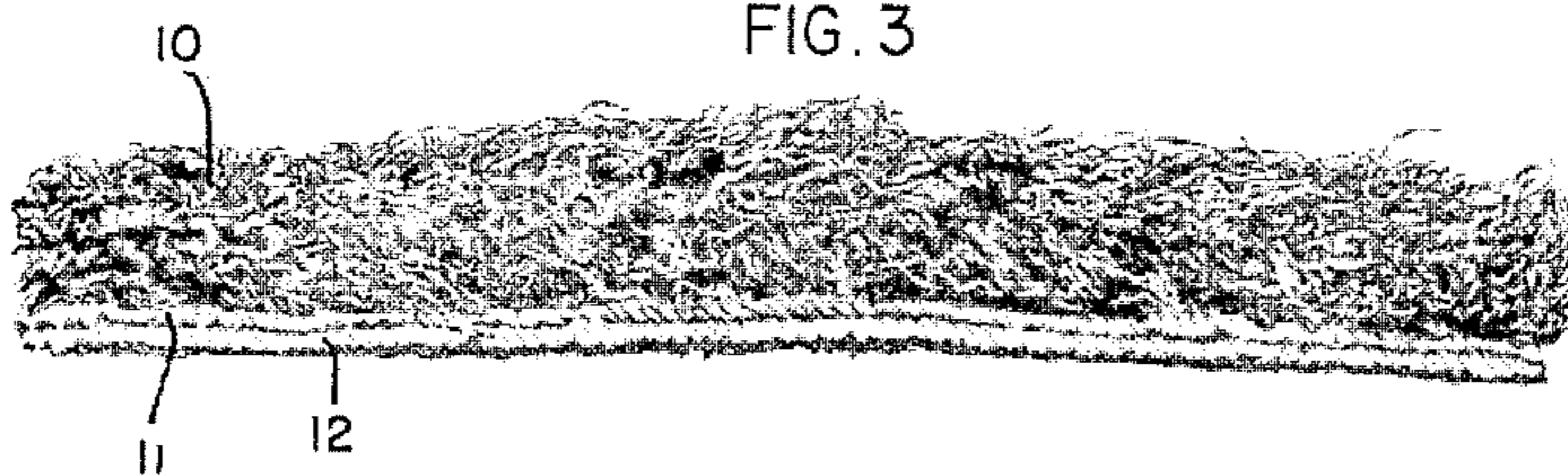


FIG. 3



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## UNITED STATES PATENT OFFICE

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## METHOD OF MAKING ABRASIVE PADS

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2 Claims. (Cl. 28—72)

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The present invention relates in general to abrasive pads, and more in particular to pads employing steel or other metallic wool as the abrasive medium, and the object of the invention is a new and improved article of this character.

A special object of the invention is a knitted pile fabric, having a steel wool pile, from which abrasive pads of any desired size and shape may be manufactured.

The invention will be described more in detail in the following specification, reference being had to the accompanying drawing, in which—

Fig. 1 is a top or plan view of an abrasive pad made from my improved steel wool pile fabric;

Fig. 2 is a rear view of the same, showing the canvas or duck backing material, also the knitted base of the pile fabric; and

Fig. 3 is an edge view of the abrasive pad, showing the height or thickness of the steel wool pile.

Referring to the drawing, the abrasive pad therein shown is of rectangular shape and is suitable for hand use. It comprises a piece of knitted steel wool pile fabric and a backing of woven canvas or duck secured thereto by means of a suitable cement or other adhesive. At one corner of the pad the backing material has been left free so that it can be folded back as seen in Fig. 2 to expose the back of the pile fabric.

The knitted base of the pile fabric is made with the jersey stitch and is indicated at 11 in Figs. 2 and 3. Mercerized cotton thread may be used, size 2/24, and there may be, for example, 10 or 12 stitches to the inch. The pile is of steel wool, although other metallic wool could be used, and is indicated at 10 in Figs. 1 and 3. The backing material may be of any suitable canvas or duck and is indicated at 12 in Figs. 2 and 3.

The knitted steel wool pile fabric may be manufactured on a combined knitting and carding machine of the general type shown in the patent to Moore, No. 1,848,370, granted March 8, 1932.

The particular machine used in the manufacture of the pile fabric shown in the drawing comprises a circular latch needle knitting machine manufactured by the Wildman Manufacturing Company, of Norristown, Pa., modified by the addition of a pair of feed rollers and four serially related carding rollers for feeding the steel wool to the needles at the knitting position.

The steel wool is supplied in the form of a continuous roving which is taken up by the feed rollers and passed on to the first of the carding rollers. These rollers revolve at successively higher speeds, as is well known, with the result

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that the steel wool roving is pulled apart and broken up as it is transferred from each carding roller to the next in the series, and is thus prepared for delivery to the needles of the knitting machine. The carding rollers not only prepare the steel wool as described, but they accelerate it by stages until at the final stage it is moving at the proper speed for smooth transfer from the carding roller to the needles. In the case of the manufacture of wool pile fabrics for overcoats, blankets, etc. the ratio of the speed of the last carding roller to the cylinder speed is about  $7\frac{1}{2}$  or 8 to 1, but in the manufacture of my steel wool pile fabric a slower speed for the carding roller is to be preferred. A speed ratio of 5 to 1 has been found to be satisfactory.

Since the maximum pile thickness or depth is desirable, the speed of the feed rollers should be adjusted so that the roving is fed along about as fast as it can be handled, that is, as fast as the material can be taken off the final carding roller by the needles. The fibers of steel wool are straightened out and laid parallel to each other more or less by the carding operation, sufficiently so that in the knitting operation the needles are able to seize uniform bunches of steel wool fiber which are incorporated in the stitches of the base fabric along with the thread of which it is formed. The steel wool pile is thus very firmly anchored to the knitted base fabric. The steel wool is crinkly and resilient, causing the fibers locked in adjacent stitches to become intertwined and matted together as can be seen in Fig. 1.

Having made a sheet of the steel wool pile fabric of convenient or desired size, the backing material is applied thereto by means of suitable cement or other adhesive. A synthetic latex rubber adhesive has been found to be very satisfactory. Adhesives of this type are cured by a moderate heat treatment and are well known. It may be pointed out that the surfaces of the duck 12 and the knitted base material 11 are well adapted for joining by an adhesive of this nature, which penetrates well into the interstices between the fibres of the materials, and a very good bond may be secured without difficulty.

Abrasive pads of the desired size and shape may now be punched from the finished sheet by means of a die. The pads may be square or rectangular as shown in the drawing. Round pads may also be made, having a hole in the center for attachment to a motor driven arbor.

It will be understood that the pile fabric can be cut up or pieces punched therefrom before the

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backing is applied, and in some cases this procedure will be preferred.

The invention provides an abrasive pad which is superior to anything of the kind which has been known before. Attempts have been made in the past to use steel wool in the manufacture of abrasive pads, but have been unsuccessful because with the methods employed, it was not possible to firmly attach any sizable quantity of the wool to the backing material. This is essential to success, particularly for motor driven pads. The difficulty is overcome by the present invention, which excels both as to the amount of steel wool per unit area of the pad and as regards its secure attachment to the backing material. The solution of the attachment problem by incorporating the steel wool as a pile in a knitted pile fabric, which is attached to the backing material by an adhesive, is especially fortunate. The steel wool pile is indestructably locked in the stitches of the pile fabric and the latter is substantially inseparably bonded to the backing material, providing an abrasive pad having an exceptionally long life.

The invention having been described, that which is believed to be new and for which the protection of Letters Patent is desired will be pointed out in the appended claims.

I claim:

1. The method of manufacturing stock for abrasive pads, which consists in making a knitted fabric on a knitting machine, while feeding steel

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wool to the needles of said machine to incorporate said steel wool in said knitted fabric as a pile, and joining a layer of woven material to the back of said knitted fabric by means of an adhesive.

2. The method of attaching steel or other metallic wool to heavy woven material such as duck, which consists in breaking a continuous roving of metallic wool by carding, feeding the broken wool to the needles of a knitting machine while making a knitted fabric thereon, whereby said wool becomes incorporated in the stitches of said fabric to form a pile on one side thereof, and bonding said woven material to the other side of said fabric by means of an adhesive.

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