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METHOD FOR MAKING FIBROUS PAD OR MAT

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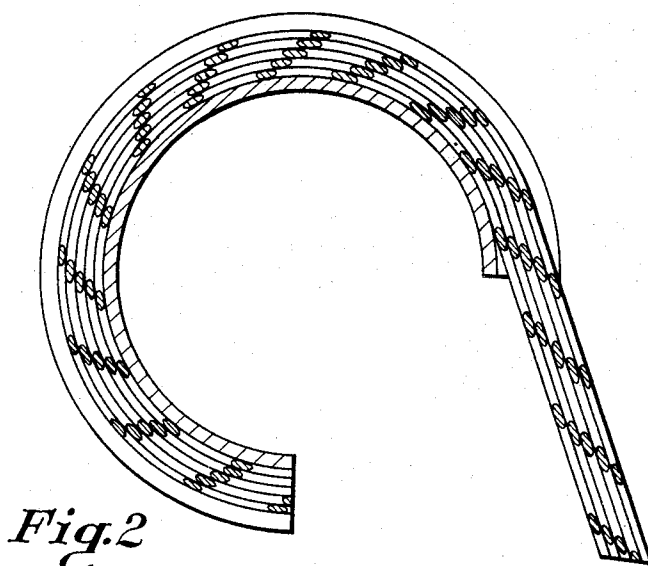


Fig. 2

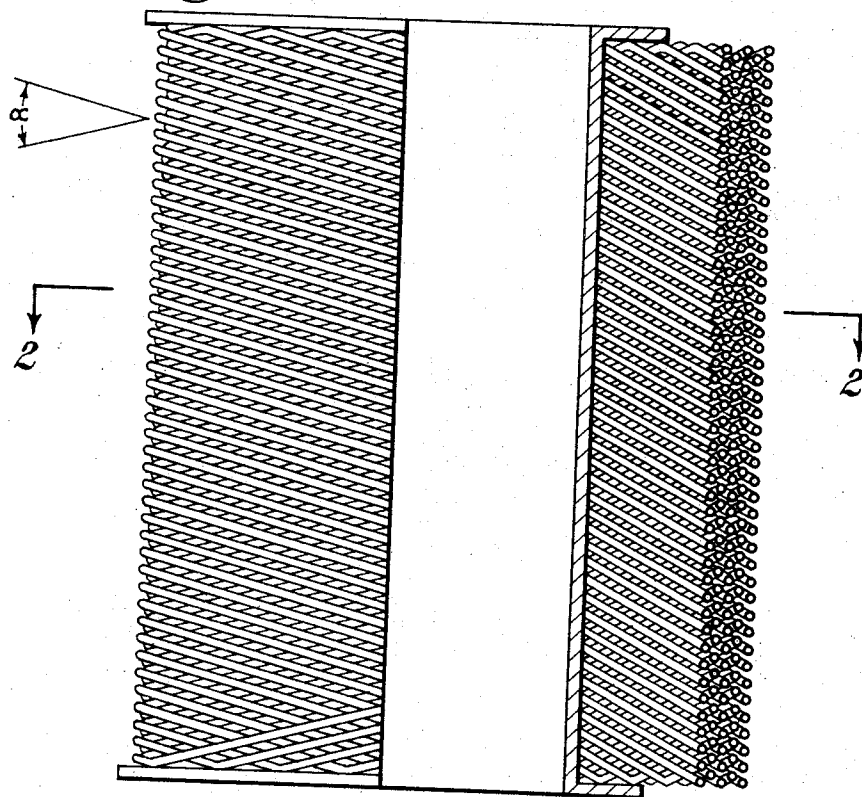


Fig. 1

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METHOD FOR MAKING FIBROUS PADS
OR MATS

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1 Claim. (CL 28—72)

This invention relates to a method of making pads, mats, bats, or like aggregates of fibrous material and to the product thereby obtained.

Numerous uses are known for mats, or pads, composed of crossed filaments. Among such uses are as filters, as insulation, or as padding for upholstering, and the like. The methods whereby such mats have been produced in the past are cumbersome and require far too much manual operation.

It is accordingly an object of the present invention to provide such articles, and a simple method whereby they may be made. It is a particular object to provide a method whereby mats, or pads of fibrous material, may be prepared in a continuous manner from a yarn or filament of the desired composition.

In the accompanying drawing, Fig. 1 illustrates a mat or pad, made according to the invention, being stripped from the spool whereon it was made; and Fig. 2 is a plan view taken along line 2—2 of Fig. 1.

According to the present invention a continuous yarn, thread, string, or filament, is wound on to a bobbin, or spool, of any desired size, employing a higher ratio of traverse speed to winding speed than in most commercial spooling practice. Alternatively, several filaments may be wound on to a single spool at once. The winding is continued until the desired thickness of yarn has been built up on the bobbin, whereupon the winding is discontinued and the accumulated load is cut from the bobbin by a single cut extending from one end of the bobbin to the other, either parallel to the axis or helical with respect to the axis. There is thus produced by a surprisingly simple operation a pad or mat of high uniformity which is superior to pads of the same material produced by the heretofore known methods.

During the winding operation above referred to, it is desirable to employ such a ratio of traverse speed to winding speed that successive layers of the yarn, or filament, lie at an angle α greater than 5° with respect to one another. During the customary spooling of thread, for example, this angle is of the order of 2° to 3° or less. If the thread were to be cut from an ordinary spool, the angle at which successive layers cross one another would be found to be too small to give the mat form and lasting shape. For the present purposes it is preferred that the angle at which successive threads cross one another should be from about 15° to 60° or higher.

The following example illustrates the practice of the invention.

A tightly twisted yarn made of 18 fine filaments of a co-polymer of 90% vinylidene chloride and 10% vinyl chloride was wound continuously on to a cylindrical bobbin 3.5 inches in

diameter and 6 inches long. The traverse arm was adjusted to make approximately one complete cycle for each 4 revolutions of the bobbin. The angle α at which successive layers crossed, varied from 32° to 48° . The bobbin was driven at a rate of about 1200 R. P. M. The tension on the yarn during winding was maintained at about 20 grams. The bobbin was thus loaded at a rate of about 1200 to 1400 feet per minute, and after 10 minutes operation, a load about $\frac{1}{2}$ inch thick had been built up on the bobbin. Winding was discontinued, the bobbin removed from the machine, and the accumulated yarn was cut from the bobbin by a single knife cut longitudinal of the bobbin. The load was taken from the spool as a soft, rather fluffy mass of criss-crossed fibers which was useful as a filter pad or as thermal insulation.

The material of which the new mats are constructed is no part of the present invention. The herein described method is adapted to be used with any material available in thread or yarn form, and materials of the type whose production is described may be made of cotton, silk, wool, synthetic fibers of all kinds, or from glass filaments.

The invention has been illustrated with respect to a method wherein the fibrous mat is cut from the spool on which it was made, by a single cut vertical to the direction of winding, or parallel to the axis of rotation of the spool. It is to be understood that this is but one embodiment of the invention, as other sizes and shapes of mats may be obtained by cutting the load from the spool in other manners. Thus, if a helical cut is made from one end of the bobbin or spool to the other, the shape of the mat can be varied widely, depending on the pitch of the helix.

The invention is not limited to small bobbins or spools of the sizes usually brought to mind by those terms, but may be applied to winding cores of any length or diameter. For convenience, all such winding cores will be designated as "spools" in the claim.

If desired, the cordage being fed to the bobbin may be dipped in or sprayed with an adhesive, to minimize slippage of the criss-crossed filaments after the mat is cut from the bobbin.

I claim:

The method which comprises spooling cordage at such a ratio of traverse to winding speeds as to cause successive layers of the cordage to cross one another at an angle between about 15° and about 60° , and, when the desired thickness has been built on the spool, cutting through the load from one end to the other of the spool, and removing the so-formed mat from the spool.

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