No. 875,066. PATENTED DEC. 31, 1907.

W. R. GREEN.

ABSORBENT MATERIAL.

APPLICATION FILED DEC. 27, 1905.

Fig. 1.

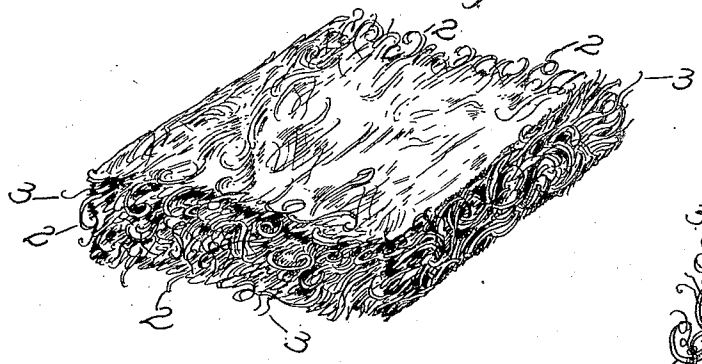


Fig. 2.

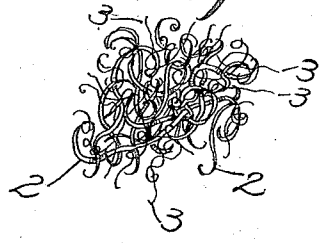


Fig. 3.

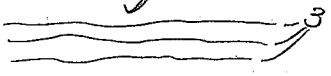
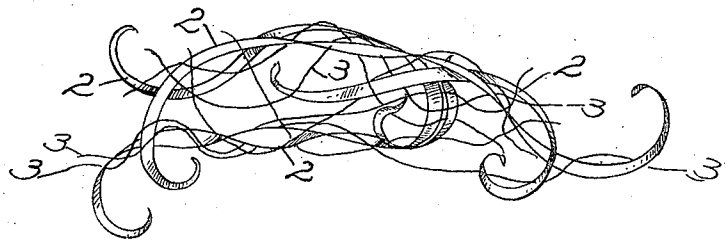


Fig. 4.



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ABSORBENT MATERIAL.

No. 875,066. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed December 27, 1905. Serial No. 293,505.

To all whom it may concern:

Be it known that I, WILLARD R. GREEN, a citizen of the United States, residing in Muscatine, in the county of Muscatine and State of Iowa, have invented certain new and useful Improvements in Absorbent Material, of which the following is a specification.

This invention relates to an absorbent material for surgical purposes, the object thereof being to provide an improved material of this character partly made up of paper strands or ribbons, which may be suitably treated if desired.

The object of my present improvement is to provide an absorbent material having a high absorptive power and adapted to quickly take up and retain free running liquids, and to produce this material in the form adapted for varied uses and which can be manufactured and supplied to the trade at a low cost.

A further object is to provide a suitable framework of paper ribbons to support and keep open a suitable fiber when intermingled therewith, such for instance as that used in the making of paper pulp and which is produced by grinding wood preparatory to the making of the same into paper pulp. This wood fiber is usually extremely fine and uniform in quality, but is not well adapted for use in the separate mass because of the fineness of the same and the practical difficulties incident to holding the fine fiber in place when it is arranged or disposed in relatively thick masses within the absorbent material, or within an absorbent article, such for instance as an absorbent pad or bandage.

For accomplishing these purposes, in accordance with my present improvements, I mix the fiber, wood or vegetable, with paper in the form of relatively large strands or ribbons, whereby it will have a relatively open character or quality adapting it to absorb limpid fluid and to hold the same with a good degree of tenacity.

In my contemporaneously pending application Serial No. 217,972, filed July 23, 1904, which on January 16th, 1906 matured into United States Letters Patent Number 810,139, I have disclosed an absorbent material for surgical purposes in which the framework supporting mass is made up of woody strands or ribbons, and the filling for this framework is made up of relatively fine fibrous paper clippings which are bent or curled. The present absorbent material is the reverse of that shown in that application, in that the framework is made up, not of woody strands or ribbons, but of paper strands or ribbons, while the filling is made up, not of paper, but of a suitable fiber. It also differs from the disclosure there shown, in that the paper strands or ribbons in the present instance are so treated that they will be curled or twisted. This is essential when paper is used in the form of ribbons or strands in order to form suitable cells or chamber-spaces throughout the mass for the fibrous filling.

In the drawings accompanying and forming part of this specification, Figure 1 illustrates a suitably compacted mass of this absorbent material; Fig. 2 illustrates more in detail the commingled paper strands and fiber, the fine lines illustrating the fiber; Fig. 3 is a view illustrating the filaments or fiber which are used as a part of the filling of this absorbent material; and Fig. 4 is an enlarged view of the paper ribbons or strands in the form in which they are used with the fiber.

Similar characters of reference indicate corresponding parts in the different figures of the drawings.

In practice the material or paper is cut into narrow and relatively extended forms analogous in a general way to ribbons or strands 2. These paper strands or ribbons thus artificially produced, and which are in a curled, twisted, bent or scroll-like form owing to their treatment, mode of production or assemblage, are then incorporated by suitable mechanical manipulation with filaments or fibers 3, preferably of vegetable character, such for instance as cotton fibers or well divided linen fibers, and thus constitute a binding or holding means for retaining the paper strands. The mass is usually formed into a layer of suitable thickness and has a relatively soft, pliable texture that is required for use for surgical purposes generally.

The quantity of the binding fibers may, of course, be considerably less by weight, as well as by volume, as compared with the paper component of the finished material; but it will be observed that the manner in which the two materials are incorporated together to form the absorbent mass makes the two kinds of components of said mass effectively coöperate for the purpose of creating within the same interstices and cell-like spaces of various sizes, but all of relatively small dimensions. These cell-like

spaces extend throughout the entire mass, round about and among the paper strands or ribbons of the mass, with the result that the mass is provided with highly diversified receiving and distributing channels or interstices, a considerable part of which will be of a cell-like character through which the fluid can pass in its flowage through the mass after coming against the cut surfaces of the paper components of the mass. By this means the paper is so situated and conditioned that the principal absorptive power thereof normally will occur on the surfaces which are produced by the cutting or severing of the paper into the small pieces or strands, instead of being absorbed principally through the side surfaces of said paper component. In this connection it will be remembered that when a blotting paper is used for taking up fluids, the fluid enters the paper through the side surface of the same, and while this action will, of course, occur in the present case, the manner of producing the paper components of the mass naturally produces a large amount of absorptive surface that is an edge-surface. This feature permits the use of a paper sheet for making clippings in which the side or outer surfaces of the paper sheet may be more highly sized than the middle portions of the paper stock or sheet; this being deemed of advantage in making a highly absorbent paper stock composed almost entirely of the fine wood fiber, and which at the same time will hold together properly after the paper sheet has been divided up into strand-like elements and these have been incorporated with the binding and coacting fibers in the finished absorbent material, since the sized strands are relatively insoluble, or slowly soluble, and thus adds materially to the stiffness of the material and therefore to the framework which supports and keeps open the fiber to form the cells or spaces.

The absorbent material herein shown and described is for hygienic and surgical purposes, in the form of bandages or otherwise, and the term "surgical" in the claims is intended to cover such uses.

I claim as my invention:

1. An absorbent material for surgical purposes, comprising a body or frame-work made up of curled ribbons or strands of fibrous paper and having intermingled therewith a filling of fibers or filaments.

2. An absorbent material for surgical purposes, comprising a body or frame-work made up of curled ribbons or strands of paper having intermingled therewith a filling of vegetable fibers such as cotton or linen fibers or filaments.

3. An absorbent material for surgical purposes, comprising a body or frame work made up of ribbons or strands of paper having intermingled therewith a filling of fibers, such for instance as vegetable fiber.

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