

W. R. GREEN.
PAPER MANUFACTURE.
APPLICATION FILED JAN. 13, 1906.

Fig. 1.

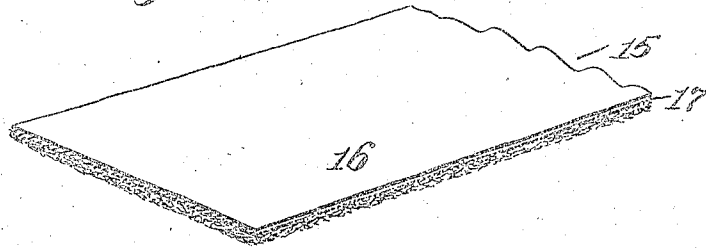


Fig. 3.



Fig. 2.

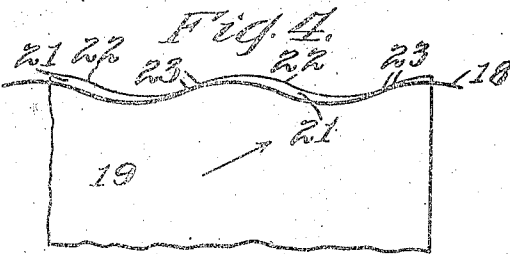
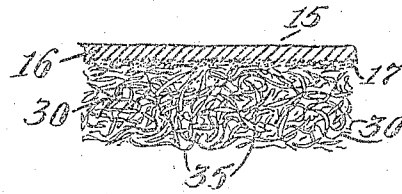


Fig. 5.

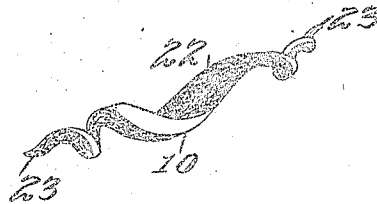


Fig. 6.

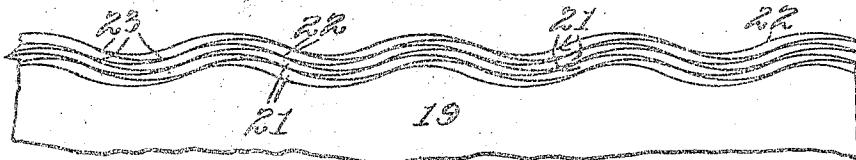
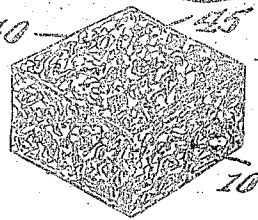


Fig. 7.



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J. A. Richards.

UNITED STATES PATENT OFFICE.

WILLARD R. GREEN, OF MUSCATINE, IOWA.

PAPER MANUFACTURE.

No. 875,068.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed January 13, 1906. Serial No. 295,908.

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 Paper Manufacture, of which the following is a specification.

This invention relates to an improved paper manufacture, and an object of my present improvement is to manufacture paper into fiber-strands especially adapted for use in making absorbents of that class in which the mass of fiber composing the same is so constituted and organized as to provide active absorptive qualities combined with efficient distributive qualities.

It will be remembered that in using some kinds of absorptive materials, such for instance, as fine vegetable fibers massed together, such as cotton or linen fiber, for instance, there is a marked tendency in many cases, especially where the fluids to be absorbed are of a slightly pasty or albuminous character or of a coagulative nature for the thicker components of the fluid to form a coating over the exterior mass of the fiber and so prevent the efficient operation of the fiber as an absorbent for the more fluid portions of the substance to be absorbed.

One of the objects, therefore, of my present improvement is to minimize those objections, and these I accomplish in the present instance by manufacturing suitable and relatively fine fibers into relatively larger fiber like bodies or "fiber-strands" and by mingling these together either by themselves or mixed with another and preferably finer fiber component, to thereby obtain a highly active absorbent quality while maintaining the mass of the whole sufficiently open in its texture or composition to provide for the necessary free distribution between such larger strands of which the mass is composed.

One feature of my present improvement relates to the reinforcement of the manufactured fiber-strand in such a manner that each fiber-strand will be self sustaining and resist compression and "matting" when the mass is subjected to the action of fluid. This may be produced by some adhesive substance, which in practice may be in the nature of a glue or cement-like material relatively non-soluble in water carried by one surface of the fiber-strands. The reinforcing either by treatment of the surface of the

fiber sheet or by the application thereto of some suitable reinforcing substance followed by the subsequent dividing up of the sheet into fiber-strands of proper size and shape and the curved formation of these, added to the curly and spiral formation which may be given them in the dividing or severing operation will give the mass a self sustaining quality enabling it to resist compression and also to resist the action of the fluids received by it having a tendency to cause the mass to mat together.

Drawings illustrating my present improvement accompany this specification, and wherein

Figure 1 illustrates in perspective a sheet of material prepared for the production of the fiber-strands; this view is on an enlarged scale. Fig. 2 is a sectional view of a portion of such sheet of material and is shown in still further enlargement. Fig. 3 illustrates in plane view a sheet of material and a form of knife in horizontal section, the knife is shown as having made the first cut in severing the sheet into a number of fiber-strands. Fig. 4 is a view similar to Fig. 2 showing the knife after it has made its second cut and wherein it has produced a number of fiber-strands. Fig. 5 is a perspective view of one of the fiber-strands. This is shown in an enlarged manner for the purpose of clearness. Fig. 6 illustrates the feeding movement; and Fig. 7 shows a mass of the fiber strands.

The absorptive elements embodied in the present improvement are each composed of a plurality of what are frequently designated fibers, and is made up into a body which from its length and narrowness might be designated a strand and which I have herein designated a "fiber-strand", although in some aspects it would not be strictly called a strand.

A feature of my improvement relates to the construction of the fiber-strand, as Fig. 5, of a form deviating substantially from a straight line, and in some cases curled into a spiral formation so as to provide for a lesser actual quantity of material when the fiber-strands are promiscuously massed together in a form suitable for application as an absorptive material. In Fig. 1 is illustrated, in a somewhat enlarged view, such a mass prepared in sheet form, but, of course, it will be understood that the material may be made in ribbon or in rope-like formation, forced or otherwise shaped into a body or

mass as may be required for any particular use.

In manufacturing my improved absorptive fiber-strands I prefer to employ the ordinary "wood fiber" so called, this being of a very fine nature and adapted to pack together closely for many of the purposes for which such materials are employed, and having the advantage of low cost, cleanliness and freedom of admixture with materials of an unfavorable character. In connection with this material I prefer to employ for the finer qualities of the sheet form absorbents a moderate admixture of cotton or linen fibers, or some other vegetable fiber of analogous character. These fine fibers, indicated by 30 in Fig. 2, being relatively long, and if well distributed throughout the mass assist in holding the short wood fibers, indicated by 35 in Fig. 2, together during the preparation of the same into sheet form preparatory to converting this sheet material into my improved absorptive fiber-strands. In practice a small percentage of vegetable fiber, as for instance one to two per cent. by weight may be employed. The sheet material having been prepared in this or any other suitable manner I then, in practice, apply the reinforcing material in the form of a layer spread or suitably applied to one side of said sheet material, and after the reinforcing material is sufficiently seasoned or dried, as the case may be, I prepare the sheet material so treated or reinforced into fiber-strands by cutting or otherwise dividing the same. For this purpose I may employ a special apparatus designed therefor, and which forms the subject-matter of a copending application, filed January 13 1906, Serial No. 295,907.

The sheet of material made in some suitable manner from the wood fiber, or the wood fiber suitably mixed with the vegetable fibers for binding it together, and designated herein in a general way by 15, is shown as having applied to one surface thereof a coating 16, which may be of some suitable stiffening material as above alluded to, it will preferably be such as will adhere merely to the surface of the sheet of fibrous material, and will not permeate the same to any great extent, since should it do so it would occupy the interstices of the mass which should be left open for the more fluid portions of the material for absorption. The stippling 17 is for the purpose of designating one manner in which the two bodies, the fibrous sheet and the reinforcing material, may adhere together.

In Figs. 4 and 5 a manner is shown in which the sheet may be divided up into a series of fiber-strands, the knife blade designated by 18 in Fig. 3 which is represented as sinuous is shown as having descended into the sheet 19 and cut off an end 20; this of course is the first position. In Fig. 4 the

knife is shown as having made a second descent, and the sheet 19 is shown as having been advanced forward and sidewise so that the line of cutting will come in such a position that a number of bodies 21 will be severed from the stock. Each of these bodies is shown as being wider at the central portion 22 and tapering down toward the ends 23, which in the present instance are shown as attenuated to points. These bodies when cut and considered irrespective of the curl incident to the shearing action are of a curved or analogous form, and may be of an ogee formation. The knife will preferably cooperate with some other knife and produce shearing cuts, and in such shearing, assuming that the cutting commences at one end of the strips, the strips will curl upon themselves. In some forms of knives which may be used, the surface of the sheet which is toward the direction of the descending knife will curl upon the outer side of the fiber-strand 10. In the present illustration the stiffening material is shown uppermost, and in the illustration in Fig. 5 such stiffening material is shown upon the outer surface of the fiber-strand. If, however, it is desired to have the absorbent material upon the outer side and the stiffening material upon the inner side the fibrous portion of the sheet will be presented to the shearing knife; the curl can thus be readily controlled to suit the various requirements of practice.

It is preferable that the cutting be carried on in such a manner that the cut edges are left clean and free from projecting fibers or from fuzz or dust of torn fibers, since advantages accrue from having each fiber-strand present an unobstructed surface, thus providing for a highly efficient absorptive quality over a large area of surface, while at the same time preventing obstruction by the fuzzy material of the distribution spaces within the mass of material, and more particularly at the orifices of the interstices at the surfaces of the fiber-strands. The process of producing these fiber strands is made the subject of my copending application filed January 13, 1906, Serial No. 295,909.

In Fig. 7 an absorptive mass 40 is illustrated made up of a quantity of fiber-strands 10 and vegetable fibers 45, such for instance as cotton or linen intermingled with the fiber-strands and binding these together, and somewhat assisting in the distributive and retentive qualities of the mass.

An absorptive mass must not only be such as will readily take up within itself a quantity of material for absorption, but must be capable of retaining the material so received, and must not pack down and mat together upon the application of fluid, or upon the application of fluid combined with such pressure as the mass will be subjected to in the use to which it may be applied.

The improved paper manufacture herein shown and described is particularly adapted 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.

Having described my invention I claim:

1. A paper manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting paper fiber strands intermingled to form distinct open distribution spaces, each fiber strand having a non-soluble adhesive coating on one side thereof.

2. A paper manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting paper fiber strands made up from wood fiber intermingled to form distinct open distribution spaces, each fiber strand having a non-soluble adhesive substance on one side thereof, and tapering toward its ends.

3. A paper manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting curled paper fiber strands intermingled to form distinct open distribution spaces, each fiber strand having a non-soluble adhesive coating on one side thereof.

4. A paper manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting paper fiber strands, each comprising intermingled wood fiber and vegetable fiber, and each of said strands having an adhesive stiffening coating on one side thereof.

5. A paper manufacture for surgical purposes, comprising a sinuously formed strip of absorptive paper.

6. A paper manufacture for surgical purposes, comprising a sinuously formed curled strip of absorptive paper.

7. A paper manufacture for surgical purposes, comprising a sinuously formed strip

of absorptive paper with a reinforcing coating of non-soluble adhesive material upon one side thereof.

8. A paper manufacture for surgical purposes, comprising a sinuously formed strip of absorptive paper made up from intermingled wood fiber and vegetable fiber, and a reinforcing coating of adhesive material upon one side thereof.

9. An absorbent manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting sinuous fiber strands, each such strand comprising intermingled wood fiber and vegetable fiber.

10. An absorbent manufacture for surgical purposes, comprising a mass of self-sustaining and mat-resisting fiber strands, each such strand comprising intermingled short wood fiber and relatively long vegetable fiber.

11. An absorbent manufacture for surgical purposes, comprising sinuously formed strips of absorptive material, each such strip made up of intermingled wood fiber and vegetable fiber.

12. An absorbent manufacture for surgical purposes, comprising sinuously formed strips of absorptive material, each such strip made up of intermingled short wood fiber and relatively long vegetable fiber.

13. An absorbent manufacture for surgical purposes, comprising sinuously formed strips of absorptive material, each such strip made up of intermingled wood fiber and vegetable fiber, the former largely predominating.

Signed at Washington, D. C., this 13th day of January, 1906.

WILLARD R. GREEN.

Witnesses:

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E. J. H. CLARKSON.