P. T. JACKSON, JR.

REINFORCED PAPER FABRIC.

APPLICATION FILED SEPT. 22, 1916.

1,255,818. Patented Feb. 5, 1918.

Fig. 1

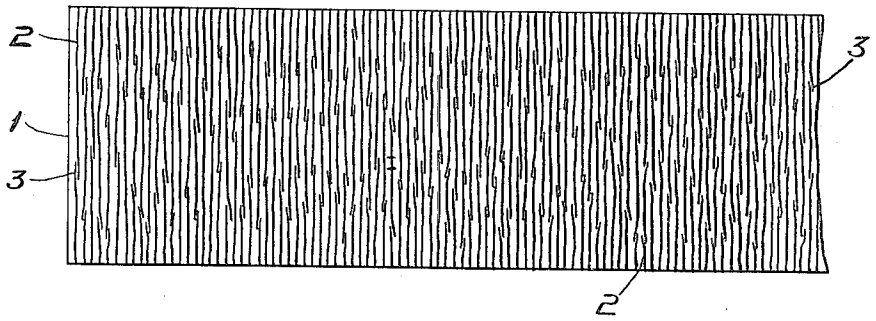


Fig. 2

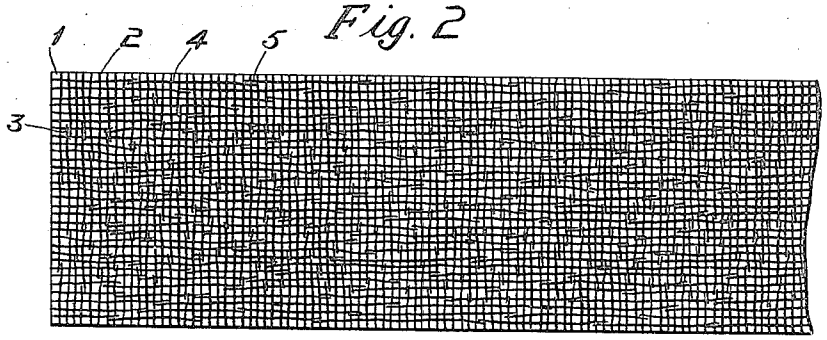


Fig. 3

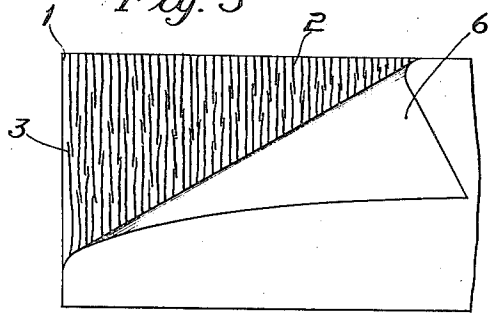
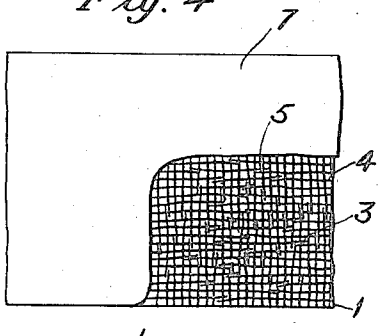


Fig. 4



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REINFORCED PAPER FABRIC.

1,255,818. Specification of Letters Patent. Patented Feb. 5, 1918.

Original application filed June 28, 1916, Serial No. 106,504. Divided and this application filed September 22, 1916. Serial No. 121,668.

To all whom it may concern:

Be it known that I, PATRICK TRACY JACKSON, JR., a citizen of the United States, residing at Cambridge, county of Middlesex, and State of Massachusetts, have invented an Improvement in Reinforced Paper Fabrics, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to reinforced paper fabrics adapted for use as a protecting cover, wrapper, or container.

Heretofore, paper fabrics of this general class have been reinforced by securing to the surface thereof threads or cords which have been previously spun or twisted into a continuous filament, and such continuous threads or cords have been laid either transversely or transversely and longitudinally upon the surface of the fabric to be reinforced.

In a prior application, filed by applicant, Serial No. 106,504, filed June 28, 1916, a machine for reinforcing paper fabrics or the like by adhesively securing thereto unspun and untwisted fibers in substantially their natural condition, was described, as well, also, as the fabric which resulted from the operation of the machine. The present application is a division of the said prior application, and is directed to the fabric itself.

The aim and purpose of the present invention, therefore, is a paper fabric for use as a cover, wrapper, or container which is reinforced by a series of unspun fibers in substantially their natural condition, secured to the fabric with the lengthwise dimension of the unspun fiber extending transversely thereof. In some cases it may be desirable that the fabric be further reinforced by similar unspun fibers extending in substantially parallel relation longitudinally of the fabric, and the invention further contemplates, therefore, such transverse and longitudinal reinforcement of the fabric by the unspun fibers arranged in their respective transverse and longitudinal directions generally parallel to each other.

The individual fibers will ordinarily be of less length than the transverse dimensions of the paper strip or fabric to which they are secured, and an important feature of the present invention, therefore, consists in adhesively securing to the fabric, the series of unspun fibers in substantially their natural state with the adjacent ends of the fibers between the side edge portions of the fabric, when the individual fibers are of less length than the width of the fabric in overlying relation.

The adhesive used for securing the unspun fibers in the described relation may be of any appropriate character, but for some purposes a water-proof adhesive is found especially fitted for this purpose. In order that the transversely extending or transversely and longitudinally extending unspun fibers may be protected, it is desirable in some instances of the invention to secure the unspun fibers in their described relation between two plies or paper fabrics.

In the drawings:—

Figure 1 is a plan view showing a strip of paper or like fabric having adhesively secured thereto a series of unspun fibers in substantially their natural condition, the ends of the unspun fibers where the fibers are of less length than the width of the fabric being in overlapping relation;

Fig. 2 is a view similar to that of Fig. 1, with the addition of the longitudinally-extending unspun fibers adhesively secured to the surface of the fabric;

Fig. 3 represents a piece of reinforced fabric comprising two plies of paper having the transversely-arranged unspun fibers secured between them; and

Fig. 4 is a view similar to that of Fig. 3, with the fibers extending both transversely and longitudinally.

Referring to the drawings, 1 represents a web or strip of paper or other fabric to be reinforced or strengthened by the application thereto of unspun fibers to form a tough and not easily torn fabric that may be safely employed as a wrapper, cover, or container for substances. The unspun fibers may be any of those now well known, either animal or vegetable, but preferably the latter, such, for instance, as flax, sisal, hemp, cotton, waste, jute, and the like. The fiber is first "prepared" in the usual manner according to the character of fiber employed, which has the effect of laying the fibers in

a general parallel relation, the word "parallel" being herein used in a general, though not strict sense, but since the machines and process for preparing fiber are well known to those skilled in the art and the invention does not relate to either, a detailed description of these machines and processes is unnecessary herein. The unspun fibers thus prepared, and graphically represented at 2 in the drawings, is then applied to the paper strip or web 1 transversely thereto; that is, the longitudinal or lengthwise dimension of the fibers extends generally cross-wise or transversely of the web or strip. Ordinarily, the unspun fibers will be applied to the surface of the fabric or paper and secured thereto by an adhesive previously placed upon the surface of the paper or supplied to the paper just prior to the time the unspun fibers are placed thereon. In some cases, the unspun fibers may be applied to the paper fabric as it is supplied from a paper-making machine, or the paper may be supplied from a suitable roll.

When the length of the individual fibers is less than the width of the web or strip of fabric to be reinforced by them, the end portions of the transversely extending fibers as at 3, Fig. 1, overlap and the overlapping ends of the fibers in different portions of the paper fabric are out of line with each other longitudinally of the fabric, so that no line of weakness is formed in the longitudinal direction of the fabric.

In Fig. 2, which represents the fabric described with reference to Fig. 1, plus the longitudinally-extending series of unspun fibers, the longitudinal fibers 4 likewise preferably have their ends overlapping, as at 5, Fig. 2, and either overlie or underlie the transversely disposed series of unspun fibers.

As hereinbefore noted, it may sometimes be desirable to protect the reinforcing fibers on account of their delicate nature, and to this end the transversely-extending fibers may be secured between the two plies of fabric as represented in Fig. 3, wherein 1 indicates one of the inclosing plies similar to that of Fig. 1, and 6 indicates the overlying ply or fabric which is adhesively secured to the under ply to protect the transversely-extending fibers by a suitable adhesive, preferably water-proof in character.

In Fig. 4, the unspun fibers extending in substantially parallel relation both longitudinally and transversely of the fabrics, are indicated as inclosed between two plies which are secured together substantially as described, for the construction indicated in Fig. 3.

The fabric produced by the adhesive application to the surface thereof of a series of transversely-extending unspun fibers, affords an excellent covering or wrapping material wherein strength and toughness is desirable, and at the same time, does not produce on the surface of the fabric the ribbed and unsightly grooved effect always apparent when the reinforcing element is formed of spun and twisted threads or cords. Inasmuch, also, as the unspun fibers when of the relatively short length have their adjacent ends overlapping and the overlapping ends of the series of transversely-extending fibers are out of line or staggered with reference to the longitudinal dimensions of the fabric, no line of weakness is produced, even though the fibers be of less length than the width of fabric to which they are adhesively applied.

What is claimed is:—

1. As an article of manufacture, a reinforced or strengthened fabric for protecting objects over or about which it is placed, comprising a paper strip or backing with a series of closely adjacent reinforcing or strengthening unspun fibers secured thereto with their longitudinal dimension extending transversely of the fabric in general parallel relation, the ends of adjacent unspun fibers extending past each other transversely of the paper strip to prevent lines of weakness longitudinally of the fabric.

2. A new article of manufacture consisting of a paper strip having a series of unspun fibers adhesively secured to the surface of the paper strip in parallel relation extending transversely thereof, and a second series of unspun fibers adhesively secured to the surface of the paper strip in parallel relation longitudinally thereof.

3. As a new article of manufacture, the improved fabric consisting of a paper strip, unspun fibers arranged in series and extending transversely of the strip with the adjacent ends of separate fibers overlapping, an adhesive for securing the unspun fibers upon the surface of the paper strip, and a second strip of paper overlying the unspun fibers and inclosing said unspun fibers between the strips.

4. A new article of manufacture consisting of a paper strip having a series of unspun fibers adhesively secured to the surface of the paper strip in parallel relation extending transversely thereof, a second series of unspun fibers adhesively secured to the surface of the paper strip in parallel relation longitudinally thereof, and a second strip of paper overlying the unspun fibers and inclosing said fibers between the strips.

5. As an article of manufacture, a reinforced or strengthened paper fabric, comprising a paper strip, a series of unspun fibers the lengthwise dimension of which extend transversely of the paper strip, the ends of transversely extending unspun fibers overlapping cross-wise of the paper strip between the edges thereof and avoiding lines of weakness longitudinally of the pa-

per strip, and a water-proof adhesive for securing the reinforcing fibers to the surface of the paper strip.

6. As an article of manufacture, a reinforced or strengthened paper fabric, comprising a paper strip, a series of unspun fibers the lengthwise dimension of which extend transversely of the paper strip, adhesively secured thereto, the ends of transversely extending unspun fibers being disposed out of line longitudinally of the paper strip to avoid lines of weakness longitudinally of the paper strip.

In testimony whereof, I have signed my name to this specification.

PATRICK TRACY JACKSON, JR.