E. CLAVIEZ.

THREAD AND PROCESS OF FORMING SAME.

APPLICATION FILED NOV. 12, 1909.

999,008. Patented July 25, 1911.

Fig. 1

Fig. 2

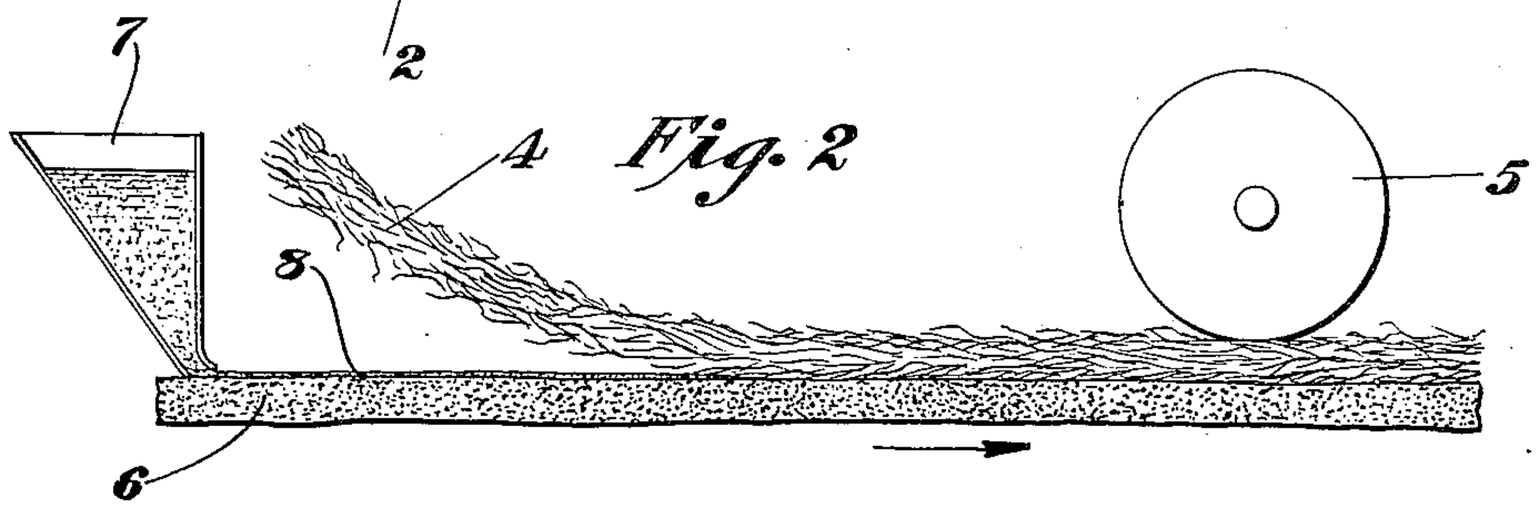


Fig. 3

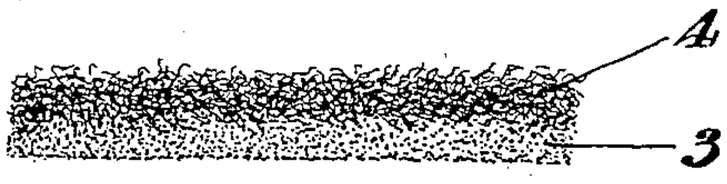


Fig. 4

Fig. 5

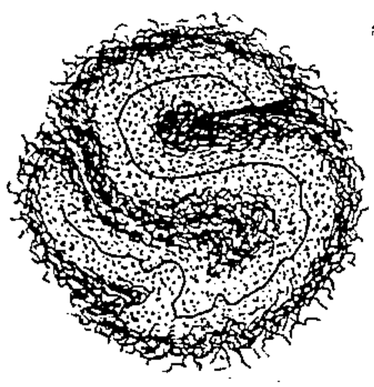
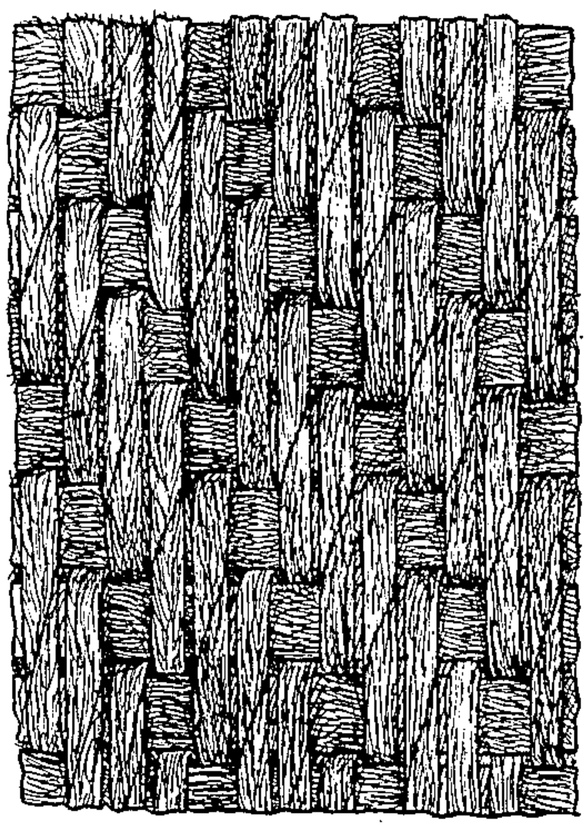


Fig. 6

Fig. 7

Fig. 8



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UNITED STATES PATENT OFFICE.

EMIL CLAVIEZ, OF ADORF, GERMANY.

THREAD AND PROCESS OF FORMING SAME.

999,008. Specification of Letters Patent. Patented July 25, 1911.

Original application filed January 27, 1909, Serial No. 474,595. Divided and this application filed November 12, 1909. Serial No. 527,595.

To all whom it may concern:

Be it known that I, EMIL CLAVIEZ, a subject of the King of Saxony, residing in the city of Adorf, in Vogtland, Kingdom of Saxony, German Empire, have invented new and useful Improvements in Thread and Process of Forming Same, of which the following is a specification.

This invention relates to thread and process of forming the same, comprising a paper portion and a fleece portion secured together, the present case being divided out from an application filed January 27, 1909, Serial Number 474,595, entitled "Manufacture of paper and the like."

Threads have heretofore been formed by twisting together strips of paper and fibrous yarn, in some instances with the paper twisted to form a core and the yarn laid upon the outside and then twisted with the paper, in other instances the reverse practice has been followed, in other instances the twisted paper and the twisted yarn have been twisted together to form a two-cord thread of paper and yarn. In all these instances the components of the resultant product are not intimately united but only assembled in contiguity. The result is that said threads are relatively low in elasticity, pliability and strength.

One object of my improvements is to produce a thread more or less free from the above objections and which can therefore be twisted into relatively fine threads suitable for textile use.

A further object of my improvements is to furnish a thread having a body portion comprising paper and fleece secured together over the whole of one surface of said paper and having a complete and uniform covering portion of fleece alone. This resultant product is particularly useful and efficient in the production of woven fabrics which can be cheaply made and in which are combined strength and closeness of weave. With my improved thread having a surrounding covering of fleece securely united to the paper portion it is possible with a relatively coarse weave to produce a close and felt-like fabric. Such fabric is particularly useful, for instance, in the manufacture of containers for finely divided or powdered products.

A further object of my improvements is to produce a duplex web of paper and fleece which can be divided into strips for twisting into threads, wherein the fleece is of relatively low grade or waste fiber which would be unsuitable for spinning separately into yarns for twisting with paper as heretofore practiced. Furthermore the labor and waste of pretwisting the fiber into yarn is eliminated even if it could be done with so low grade fiber. Such low grade fiber is however highly efficient when applied to the paper web and then made into threads in accordance with my improvements.

To these ends my improvements comprise first the securing to one side of a paper web a fibrous fleece whereby the paper is exposed on one surface and the fiber on the other surface of the duplex web thus formed, second, dividing said duplex web into strips and finally forming said strips into threads.

My improved process and product may be best understood in connection with the accompanying drawing wherein—

Figure 1 is a diagrammatic, longitudinal sectional view of one embodiment of the first step in my process. Fig. 2 is a modification thereof. Fig. 3 is a cross section of a strip corresponding with Fig. 1 and Fig. 4 is a cross section of a strip corresponding with Fig. 2. Figs. 5 and 6 are cross sections of completed threads twisted from the strips of Figs. 3 and 4 respectively. Fig. 7 is a side view of a portion of completed thread. Fig. 8 is a plan view of a portion of woven fabric made from my improved threads.

Referring now particularly to Fig. 1, 2 represents the traveling screen of a paper machine having a web of paper pulp 3 thereon, and thereabove a fleece 4 is delivered onto said pulp web at the same speed of travel as that of said web. The softness of said pulp web 3 permits the embedding therein and intimate intermingling therewith of the engaging face portions of said fleece and as the duplex web thus formed passes under roller 5 its two elements 3, 4 are squeezed together and into each other whereby their union is strengthened and fixed. The duplex web is then dried and finished by some well known means, not shown.

In the modification of Fig. 2 a web of paper 6 previously prepared is fed in the direction of its arrow and onto its upper face is fed from some suitable source of supply, as reservoir 7, a film of adhesive 8, of preferably the same width as said web.

Then a fleece 4 is delivered onto said adhesive covered face of said paper web 6 and the duplex web thus formed is then passed under roller 5 whereby the component parts are squeezed together and then allowed to dry. In this modification it is not necessary that said fleece and said paper travel at exactly the same speed at their point of meeting as is the case in the arrangement of Fig. 1 where the fleece is delivered to a soft and frail pulp. It is desirable however in the modification of Fig. 2 that the fleece be delivered at approximately the same speed as that of the travel of the paper so that the fleece will not be pulled apart by traveling too slow or wrinkled by traveling too fast.

The fleece for use in my improved process and product may be produced by any well known means such as a card and I preferably employ a fleece wherein the general direction of the fiber is lengthwise thereof so as to provide lengthwise strength and lay to the threads similar to that produced in yarns by spinning, then when a fleece of this character is laid lengthwise the grain of the paper a peculiarly strong thread material is provided. The further steps in the practice of my improved method for making my improved product are identical, irrespective of what means or method is used in securing the fleece and paper together. The duplex web is then divided into strips, preferably lengthwise said web, by cutting or other suitable means and in Figs. 3 and 4 are shown cross sections of such strips made in accordance with the primary steps of Figs. 1 and 2 respectively. I then twist said strips into threads by any of a variety of well-known means, not shown, or by hand, and so that the fleece portion forms a complete jacket or covering for said thread and so that within both paper and fleece are twisted together, the several cross-sectional convolutions mutually enwrapping, fortifying and sustaining each other. This is clearly illustrated in Figs. 5 and 6 wherein the interior arrangement of cross-sectional convolutions differ from each other at random but wherein both are fully jacketed with fiber fleece.

The cross sections of Figs. 5 and 6 are in accordance with the primary steps of Figs. 1 and 2 respectively. In addition to the usual twisting of the strips of Figs. 3 and 4 to form threads I sometimes find it desirable to rub or condense the twisted thread, thereby reducing its bulk and increasing the intimacy of the union of its cross sectional convolutions and thereby evening and smoothing the fleece covering thereof. The threads may be dyed, finished or otherwise treated either before or after weaving.

In Fig. 8 I have shown a portion of fabric woven of my improved threads wherein the threads are spaced relatively far apart both in the warp and filling and even though so spaced a relatively close and tight fabric is produced because of the fiber covering of my improved thread.

By the term "securing to one face" as herein used is meant the attaching to the surface thereof as by glue, sizing or other adhesive or the embedding in or intermingling of the fibers of said fleece with the paper pulp.

By the term "fleece" as herein used is meant a thin layer of fiber such for instance as is delivered by the doffer comb of a carding machine.

I claim:

1. The process of forming a thread including in combination, the securing to one face of a web of paper, a fleece, dividing the duplex web thus formed into strips and twisting said strips with the fleece face entirely surrounding the thread.

2. The process of forming a thread including in combination, the securing to one face of a web of paper, a fleece, dividing the duplex web thus formed into strips, twisting said strips with both the paper face and a portion of the fleece face inside and with the fleece face entirely surrounding the thread.

3. The process of forming a thread including in combination, the securing to one face of a web of paper, a fleece, having its fibers laid lengthwise said web, dividing the duplex web into lengthwise strips, twisting said strips with the fleece face entirely surrounding the thread.

4. A thread including in combination, a strip of paper and a strip of fleece, said fleece being secured to one face of said paper, the duplex strip thus formed being twisted with both the paper face and a portion of the fleece face inside and with the fleece face entirely surrounding the thread.

5. A thread including in combination, a strip of paper and a strip of fleece, said strip of fleece having its fibers laid lengthwise thereof, said fleece being secured to one face of said paper, the duplex strip thus formed being twisted with both the paper face and a portion of the fleece face inside and with the fleece face entirely surrounding the thread.

Signed by me at Plauen, Saxony, Germany this 28th day of October 1909.

EMIL CLAVIEZ.

Witnesses:
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