R. W. SEXTON.

IMPREGNATED FELT FILLER FORM

APPLICATION FILED OCT. 21, 1914.

1,224,674.

Patented May 1, 1917.

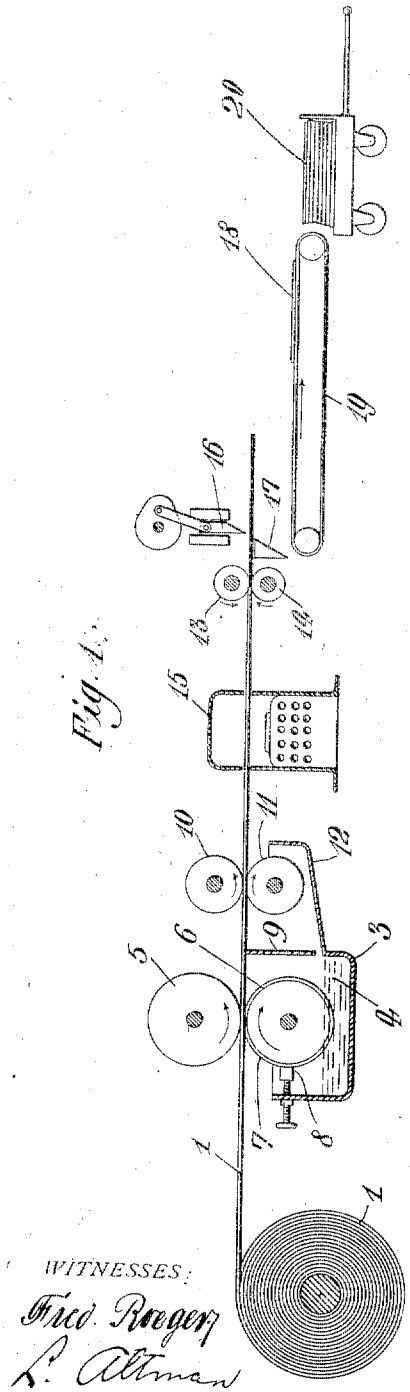


Fig. 1.

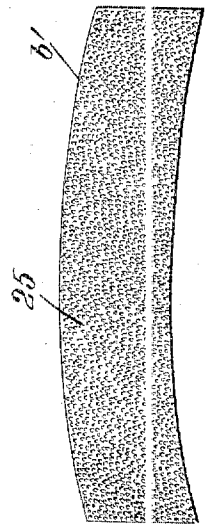


Fig. 4.

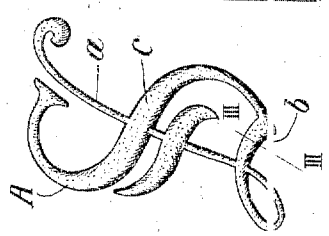


Fig. 2.

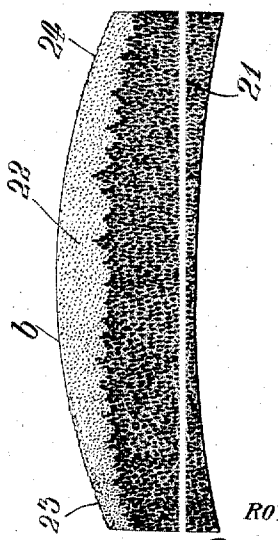


Fig. 3.

WITNESSES:

Fred. Boeger

L. Altman

INVENTOR.

ROY W. SEXTON.

BY Edward Roy

ATTORNEY.

UNITED STATES PATENT OFFICE.

ROY W. SEXTON, OF WYTHEVILLE, VIRGINIA.

IMPREGNATED-FELT FILLER-FORM.

1,224,674. Specification of Letters Patent. Patented May 1, 1917.

Application filed October 21, 1914. Serial No. 867,807.

To all whom it may concern:

Be it known that I, ROY W. SEXTON, a citizen of the United States, and a resident of Wytheville, county of Wythe, and State of Virginia, have invented certain new and useful Improvements in Impregnated-Felt Filler-Forms, set forth in the following specification.

This invention relates to washable filler forms for hand embroidery, such as serve both as a pattern for the embroidery work and as a filler to raise the embroidery from the general level of the textile fabric embroidered.

The object of the invention is to minimize the cost of manufacture of filler forms and to produce a filler form which is sufficiently tough and strong to withstand rough handling when displayed for sale in stores, and to provide all the desired qualities when incased by embroidery threads on an embroidered textile fabric. The filler forms should not disintegrate so as to fall through the covering of embroidery threads. It should preserve its form after repeated washings. It should not discolor the embroidered textile fabric and it should not be disastrously affected by water or heat from ironing. The filler forms should also be flexible.

Heretofore filler forms for embroidery have been made from compressed sheets of paper like cellulosic material, from sheets of compressed cotton wadding; from sheets made up of alternate layers of paper like fabric and cotton wadding, and from sheets made of alternate layers of a paper-like fabric and a textile fabric.

In fulfilling the objects of the present invention, a radically different fabric is contemplated, namely, a special mixture of felted fibers impregnated in a peculiar manner. Illustrative embodiments of the invention and the diagrammatic representation of its method of manufacture are shown in the accompanying drawings, which form a part of this application, in which like characters designate corresponding parts and in which,—

Figure 1 is a diagrammatic representation of the method of manufacture of one form of the invention;

Fig. 2 is a plan view of the finished product;

Fig. 3 is a section through line III—III of Fig. 2; and

Fig. 4 is a section corresponding to that of Fig. 3, but showing a modification.

It has been found that compressed cotton batting or wadding is not satisfactory for the manufacture of filler forms for embroidery, especially because the cotton fibers do not grip one another sufficiently tenaciously to prevent the bunching and unsightly distortion of a filler form when the embroidered textile fabric is laundried. On account of its cheapness cotton is, however, a desirable material for a filler form.

After extended experiments it has been found that by admixing with cotton fiber a percentage of animal fiber such as wool a tenacious felt results suitable for employment in the fabrication of filler forms for embroidery. Approximately 20% wool, to 80% cotton has been found to be satisfactory. The employment of animal fiber such as wool in the fabrication of an embroidery foundation makes a marked improvement in the finished article of manufacture. It appears that the barbed structure of the animal fibers provides a mutual interlocking of the barbs on the fibers, which gives to the members of the embroidery foundation an inherent toughness and strength even when the members are attenuated. This interlocking of the barbs on the animal fibers effectively prevents shifting or bunching of the fibers which has heretofore been detrimental to the finished embroidery when made over foundations of wadding or compressed cotton batting. This artificial fabric or felted sheet of wool and cotton is made in any suitable manner well known in the art, and is wound into a coil or roll 1. If the filler forms in the various desired designs are cut from this special felt without additional treatment, they do not possess all the qualities desired for a filler form. They are flimsy and are subject to breakage, especially in the more attenuated parts of the design, such as the stem *a* of Fig. 2.

It has been found desirable to impregnate this special felt to render it stiffer and stronger. When it is desired that the filler

form in the finished embroidery have maximum flexibility the impregnation of the filler form is of such a character as to be soluble in water, so that it washes out during the laundrying of the embroidered textile fabric, but not until after it has served the purpose of strengthening the filler form to preserve its design and shape during its handling previous to being actually incased in embroidery threads.

In Fig. 1 the vat 3 contains the impregnating fluid 4 which may be of any suitable kind soluble in water, such as flour paste, albumen, sizing or even a saponaceous solution. The felt 1 is drawn through a pair of rolls 5 and 6, the roll 6 having a fluid absorbing covering 7 which carries the impregnating fluid 4 and presses it into the fabric 1. The screw adjustable scraper 8 may be adjusted so as to regulate the amount of fluid squeezed into the fabric 1 to conform to the desired amount. Surplus liquid adhering to the fabric 1 is scraped off by the scraper 9 to run back into the vat 3. The fabric 1 then passes through squeezing rolls 10 and 11 which effect a better distribution of the impregnating fluid, and in some cases squeeze out a surplus which runs back through the hopper 12 into the vat 3. If desired the squeezing rolls 10 and 11 may be steam-heated to commence the drying of the fabric. As the fabric progresses forward under the impulse of the tracking rollers 13 and 14 it is drawn through a drying oven 15, which should be of sufficient extent practically to complete the drying of the fabric. On leaving the rollers 13 and 14 the automatically operated knife blades 16 and 17 shear off the fabric into sheets 18, which may be carried forward by the endless carrier 19 and fall into a stack 20 for removal to the stamping machines where the sheets are cut into the desired patterns.

A finished filler form is shown in Fig. 2 cut into the pattern of a text letter **S**. A cross section of this filler form is shown in Fig. 3. In the manufacture of the fabric of this filler form the impregnating process has been so regulated as by an adjustment of the scraper 8 that the impregnating fluid 4 did not completely saturate the fabric 1. The heavy stippling 21 in the cross section of Fig. 3, indicates the extent of the impregnation while the lighter stippling 22 shows the part of the fabric 1 which is not impregnated. A transversely arched cross section is imparted to the various members *a*, *b*, *c*, etc., of the filler form **A**. This is shown particularly well in Fig. 3. It is also indicated how a portion along the top face and at the edge of the members of the filler form is removed when the impregnation does not extend completely through the fabric 1, so as to leave a beveled terminal edge or face such as 23 and 24.

In Fig. 4 is shown a cross section *b*' through a filler form, the same as *b* except that the fabric 1 has been completely impregnated as indicated by the uniform stippling 25. The beveled edges or faces are not so marked in this structure.

Even when employing the special felt described herein, namely, part animal fiber, and part vegetable fiber such as cotton, it is desirable for some kinds of embroidery to increase the strength of the filler form otherwise inherent in the special felt and to increase this strength in a permanent manner so that it will remain after the laundrying of the embroidered textile fabric on which the filler forms are used. A water-insoluble impregnating fluid is employed for this purpose. This insoluble fluid may be described generically as a cellulose derivative and is limited to such a derivative as is soluble in some solvent other than water, so that it may be applied to the felt as a liquid which thickens and solidifies into a flexible stiffener.

Collodion has been employed. Acetyl cellulose dissolved in chloroform or nitro-benzole may be employed.

It is, of course, however, preferable that the impregnating filler be of such a character as to withstand heat and not be inflammable. To this end a water and heat resisting gelatin formed by treating gelatin with formaldehyde as described in United States Letters Patent to Hauser, No. 572,295 granted Dec. 1, 1896 may be employed. More preferably a solution of water-proof non-combustible cellulose derivative formed by dissolving tri-acetyl cellulose in a suitable solution such as acetic ether or acetone (five parts by weight of tri-acetyl cellulose dissolved in seventeen parts by weight acetic ether) is satisfactory. Another preferred impregnating solution having heat and water-resisting qualities is a solution of celluloid, amyl nitrate and acetyl either in suitable proportions. To this solution a little more than a trace of castor oil makes an improvement in the final flexibility of the filler form.

When impregnating the special felt with the solutions of cellulose derivative it is desirable to inclose the vats and impregnating rollers so as to confine the easily evaporating solution. Care is necessary in protecting the fabric during the drying out of the solvent which is itself inflammable. It is, of course, to be understood that any suitable apparatus for carrying out the process is available and that the rollers as for instance those shown in Fig. 1 are to be suitably driven as by belts or gearing.

The special felt may either be made by completely impregnating throughout its thickness with the cellulose derivative fluid as shown in Fig. 4 or may be only partly

impregnated from the bottom up as shown in Fig. 3.

When the fabric from which the filler forms are cut, is impregnated with a soluble filler, this soluble filler cannot be termed a permanent filler because of the fact that it is washed out in laundrying. When the filler is washed there is more tendency for the filler form to bunch or become uneven in its distribution under the embroidery threads than when it is toughened and strengthened with a filler. When the insoluble filler, preferably of a cellulose derivative, is employed, the filler may be termed a permanent filler and continually lends toughness and strength to the filler form without impairing its flexibility.

In the finished embroidery it may be regarded as an advantage to have the effect of the soft yielding cushion inherent in the said felt at least immediately under the covering of embroidery threads. This advantageous quality may be available when at the same time the filler form as a whole is protected against bunching or distortion even under the most severe handling, both before the filler form is embodied in the embroidery, as when it is on sale, and after embodiment in the embroidery, and even after the laundrying of the same. The preferred accomplishment of this result may be called a double impregnation of the fabric of the filler forms. A bottom impregnation, as indicated by the heavy stippling 21 in Fig. 3, is made with an insoluble filler such as described above. Then the upper unimpregnated section of the fabric of the filler form, that indicated by light stippling 22 in Fig. 3, is impregnated with a soluble filler. Thus the resulting filler form is completely reinforced throughout its cross section, so far as handling prior to application to the embroidered fabric is concerned. As soon as the embroidered fabric containing this filler form is laundried, the top or outer portion of the cross-section of the filler form (that indicated by light stippling 22, in Fig. 3) has removed from it the soluble filler and regains the soft cushion-like quality of the special felt, while the filler form as a whole is satisfactorily reinforced against bunching or distortion, even under rough handling, by the insoluble filler indicated by the heavy stippling 21 in Fig. 3. In addition to this top portion of the filler form regaining its cushion-like quality when the soluble filler is removed therefrom, it tends to expand and become much more fluffy than when held in compression by the soluble filler. The result is a lifting, especially in the mid-portion of the covering embroidery threads and a rounding over or off at the edges of the pattern embodied by the filler form. This expansion at the washing out of the soluble filler decidedly improves the appearance of the finished embroidery.

What is claimed and what is desired to be secured by Letters Patent is:—

A washable filler-form embodying an embroidery design adapted to be completely covered by embroidery threads and comprising a flexible form body of compressed, unwoven fibrous material, matted together, an incorporated soluble binding agent extending from one surface inward a fractional part of the entire cross-section, by which the material is stiffened and held under partial transverse compression, said soluble binding agent being removable by washing to permit the portion of the form incorporated therewith to expand, and an incorporated water insoluble binding agent extending from the other surface of the form a fractional distance inward, by which the material is stiffened and held under transverse compression.

In witness whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROY W. SEXTON.

Witnesses:
WALTON J. LARRISON,
L. ALTMAN.