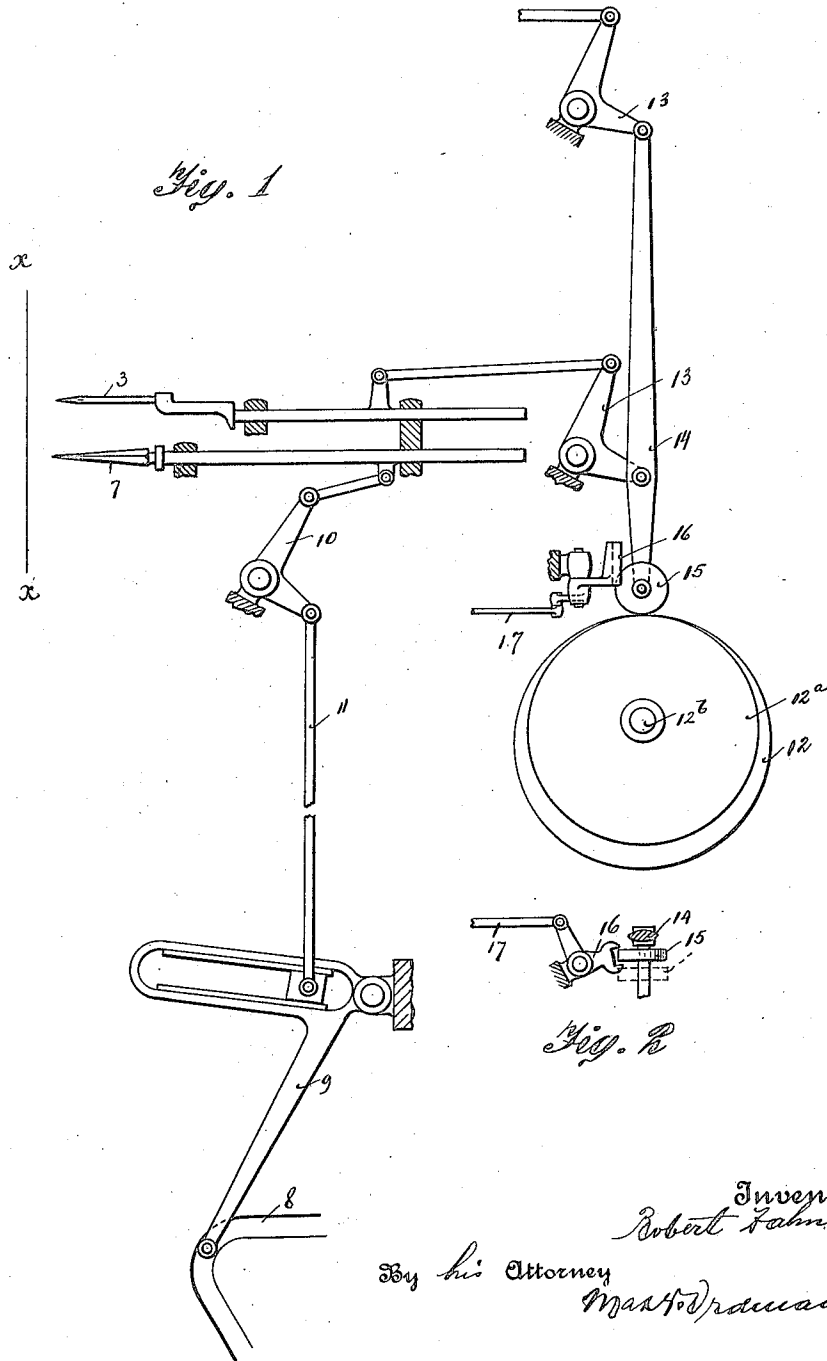


R. ZAHN, DEC'D.
A. RIETZSCH, ADMINISTRATOR.
METHOD OF BORING EMBROIDERY FABRIC.
APPLICATION FILED MAR. 5, 1915.

1,403,221.

Patented Jan. 10, 1922.



UNITED STATES PATENT OFFICE.

ROBERT ZAHN, DECEASED, BY ALFRED RIETZSCH, ADMINISTRATOR, OF PLAUEIN,
VOGTLAND, GERMANY, ASSIGNOR TO ALIEN PROPERTY CUSTODIAN.

METHOD OF BORING EMBROIDERY FABRIC.

1,403,221.

Specification of Letters Patent. Patented Jan. 10, 1922.

Original application filed July 9, 1912, Serial No. 708,496. Divided and this application filed March 5, 1915. Serial No. 12,410.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, ALFRED RIETZSCH, a subject of the German Emperor and resident of Plauen, in Vogtland, Saxony, Germany, am administrator of the estate of ROBERT ZAHN, deceased, and that said ROBERT ZAHN has invented new and useful Improvements in a Method of Boring Embroidery Fabric, (for which he has filed an application in Germany, February 6, 1912,) of which the annexed is a specification.

The present application is a division of original application Serial No. 708,496, filed July 9, 1912, which has matured into Patent Number 1,162,009 and dated Nov. 30, 1915.

As is well known, the fabric on which the embroidery is produced, is stretched taut in its frame by hooking the vertical edges thereof to the frame and fastening its horizontal edges to the fabric rollers. All efforts notwithstanding, it has been found impossible to wind the fabric around the rollers absolutely uniformly and without folds. Therefore the tension at the different points of the fabric surface is not uniform and will vary more with larger fabric surfaces. The unevenness of the tension reaches the highest degree with fabrics of the enormously large embroidering machines as now in use.

However, the unevenness of the tension, due to non-uniform stretching, in itself, after all would not be of very great importance and would not materially affect the embroidery, if at least this unevenness would remain constant during the entire embroidering process. But this is not the case. Leaving aside the fact that during lengthy periods of interruption of the work, as during dinner time and night time, owing to changes of air humidity and temperature, a distortion, often to a considerable extent of the fabric, takes place; during the embroidering work, too, a distortion is caused, that is to say, different points of the embroidery are caused to change their position relative to the needles. And that the displacement of the fabric surface is not uniform at all parts, but is smaller here and larger there, to the left at one place and to the right at another, is due to the non-uniform tension of the fabric. It is evident, that, owing to the above named cir-

cumstances, the embroidery design not only is greatly affected in its appearance, but also is frequently damaged and even rendered entirely useless. This particularly happens when distortion of the embroidery takes place at the time when the borers are set into operation. For then the sharp edges of the borers sever the adjoining already finished parts of the embroidery design.

Moreover, the borers in themselves give rise to distortion of the fabric. When the borers, of which in some machines there are about a thousand, simultaneously pierce the fabric, their sharp edges cut the fibres of the fabric, and it is evident that owing to the elasticity of the fibres, the tension of the fibres of the entire fabric surface is immediately changed. But the embroidering process itself, too, particularly during the formation of so called flat stitches, gives rise to distortion of the fabric, in that the design of the work is contracted and consequently the tension of the fabric increased. There is only that difference between the distortion caused during the embroidering process and the boring process, that during the latter the fibres are severed and the tension of the fabric is lessened instead of increased as during the former. As the lessened tension of the bored parts is not regularly compensated by the increased tension of the parts formed by the flat stitches, another cause for a variance in tension of the entire fabric is created.

The object of this invention is to provide a method of preventing, as much as possible, the tension arising during the embroidering process from affecting the embroidery design.

My new method consists in that the embroidering needles, which, as well known, are arranged in close vicinity of the borers, are caused, during the boring operation, to enter the fabric with their points only and not quite to their eyes and to be withdrawn simultaneously with the borers immediately preceding the moment when the fabric frame is to be displaced for the formation of the next series of boreholes. Thus the fabric surface becomes so to say temporarily reinforced by the needles at all those points where the borers could damage the same. As the needle points engage not only

the fabric but also the stitch holes of the rigid stitch plates, it is clear, that even a very strong lateral force could not bring about a displacement of any part of the embroidery. Hence, as long as the borers are in action the embroidery maintains its position owing to its reinforcement by the needle points.

In order to make my invention more clear reference is had to the accompanying drawing in which similar characters denote corresponding parts and in which Fig. 1 diagrammatically shows a part of an embroidering machine and Fig. 2 is a detail, showing the adjustable roller of the needle operating mechanism.

The fabric surface is denoted by reference letters $x-x$, the embroidering needles are denoted by 3 and the borers by 7. The latter are operated in well known manner from a cam 8 through levers 9, 10 and a connecting rod 11. The needles 3 are operated from the cam 12 through the medium of a bell crank lever 13 connected to a rod 14 which carries a roller 15 co-operating with the cam 12.

When it is desired to have the needles 3 engage the fabric with the points only in order to reinforce the fabric during the boring operation the roller 15 is displaced transversely to the rod 14 to bear on the circumference of another cam 12^a so fixed on the shaft 12^b that a part of its circumference coincides with that of the cam 12. The dis-

placement of the roller 15 is effected by means of a forked bell crank 16 (Fig. 2) which constantly engages the roller 15 and which may be operated by hand or from the jacquard mechanism (not shown) through the medium of the rod 17.

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

1. A method of boring embroidery fabric consisting in piercing and simultaneously reinforcing the fabric and relieving it at the moment the fabric is to be displaced for boring at another place.

2. A method of boring embroidery fabric consisting in piercing and simultaneously stiffening the surface of the fabric and relieving the latter at the moment it is to be displaced for boring at another place.

3. A method of boring embroidery fabric, consisting in piercing the borers through the fabric and simultaneously projecting the stitching needles through the fabric so as to engage the latter with their points only and removing the said needles from the fabric preceding the moment the latter is displaced for boring a new series of holes.

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED RIETZSCH,

Administrator of the estate of Robert Zahn, deceased.

Witnesses:

ROBERT H. NIER,
JOSEF GRANBY.