

No. 610,401.

Patented Sept. 6, 1898.

O. HOFFMANN.
YARN SKEIN.

(Application filed Mar. 6, 1893.)

(No Model.)

2 Sheets—Sheet 1.

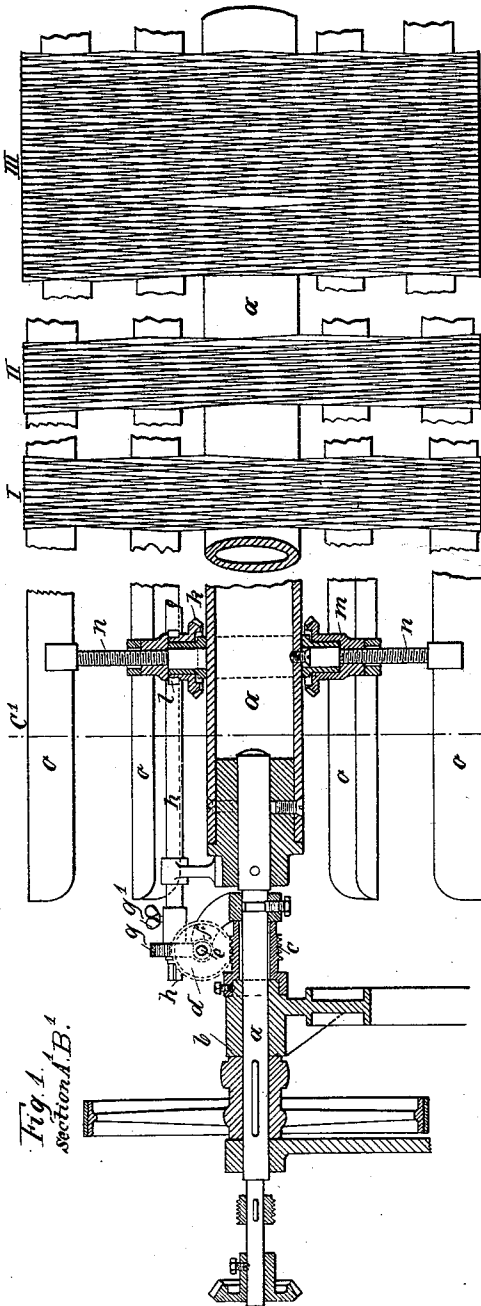


Fig. 1.
section A-B.

Fig. 4

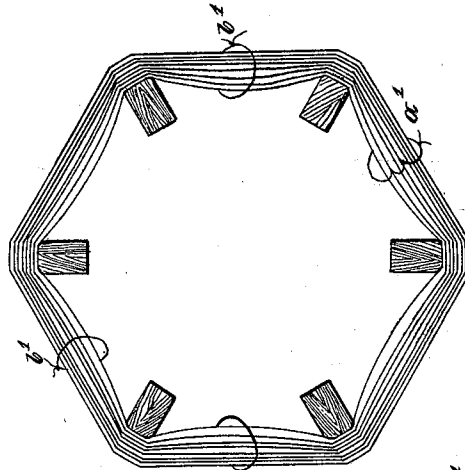


Fig. 3.
D

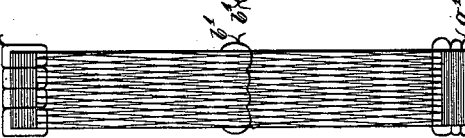
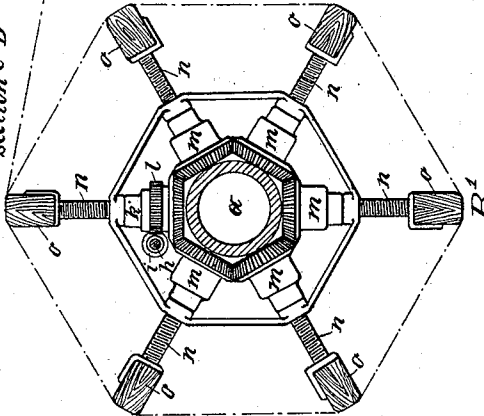


Fig. 2. A' section C'D'



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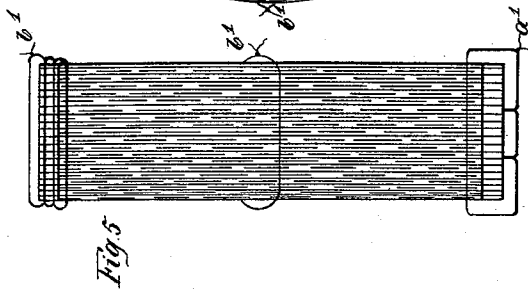
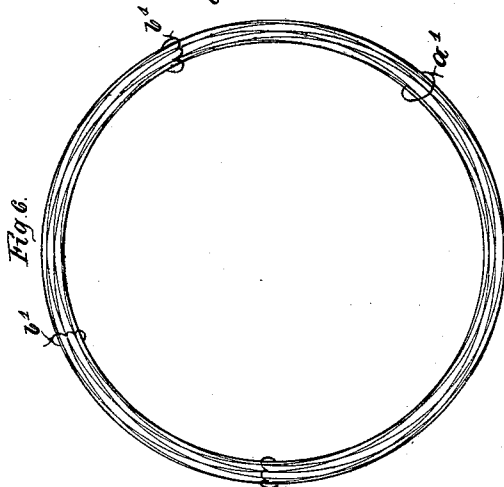
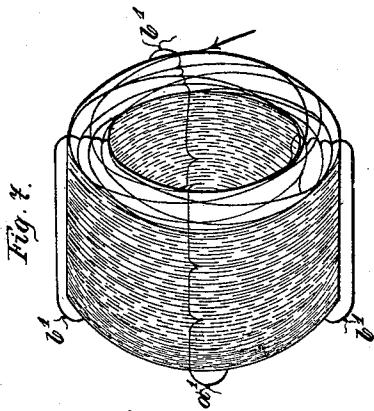
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

OSWALD HOFFMANN, OF NEUGERSDORF, GERMANY.

YARN SKEIN.

SPECIFICATION forming part of Letters Patent No. 610,401, dated September 6, 1898.

Application filed March 6, 1898. Serial No. 464,811. (No model.) Patented in France February 23, 1891, No. 211,641, and July 30, 1891, No. 215,220; in Germany March 11, 1891, No. 60,390; in England March 25, 1891, No. 5,351, and September 14, 1891, No. 15,563; in Belgium August 24, 1891, No. 96,143; in Spain September 15, 1891, No. 12,521; in Switzerland September 28, 1891, No. 4,358; in Italy October 12, 1891, No. 30,580, and in Austria-Hungary December 6, 1891, No. 40,320 and No. 65,216, and July 1, 1892, No. 5,161, and No. 18,194.

To all whom it may concern:

Be it known that I, OSWALD HOFFMANN, a subject of the King of Saxony, and a resident of Neugersdorf, in the Kingdom of Saxony, German Empire, have invented an Improved Yarn Skein, (for which I have obtained Letters Patent in the following countries: Germany, No. 60,390, dated March 11, 1891; Austria, No. 40,320 and No. 65,216, dated December 6, 1891; France, No. 211,641, dated February 23, 1891; Great Britain, No. 5,351, dated March 25, 1891; Austria-Hungary, No. 5,161 and No. 18,194, dated July 1, 1892; Switzerland, No. 4,358, dated September 28, 1891; France, No. 215,220, dated July 30, 1891; Italy, No. 30,580, dated October 12, 1891; Belgium, No. 96,143, dated August 24, 1891; Spain, No. 12,521, dated September 15, 1891, and Great Britain, No. 15,563, dated September 14, 1891,) of which the following is an exact specification.

My invention has relation to the manufacture of hanks or skeins of yarn.

Hitherto it has not been possible, when using ordinary reels, to produce skeins of yarn of sufficient thickness to be practicably suitable for the subsequent process of dyeing, inasmuch as the variations arising in the length of the individual windings prevented the hank taking the dye uniformly throughout and also caused threads to break in the process of dyeing.

The object, therefore, of my present invention is to obviate the said disadvantages, which I attain by making every thread of a skein of the same length. Consequently it is possible by this method to produce skeins of yarn of any desired thickness which can be employed for all practical purposes and which compared with those hitherto produced permit of increased production in the winding, as well as in the subsequent spooling or balling, and, further, greatly facilitates the process of dyeing, since my improved skein constantly preserves its uniform shape and because the threads being all of the same length they are subjected to uniform tension in the process of dyeing, and therefore breakages of thread and waste are avoided.

I refer to the accompanying drawings, in which—

Figure 1 is a part sectional elevation of the reel, the said part section being taken on line A' B' of Fig. 2, which latter is a cross-sectional elevation taken on line C' D' of Fig. 1. Fig. 3 is an elevation of my improved hank when the hanks are wound immediately next each other, and Fig. 4 is a transverse elevation of same shown on the reel. Figs. 5 and 6 show the said hank drawn out to a ring-like shape, and Fig. 7 is a perspective view of same on a reduced scale.

In carrying out my invention I diminish the circumference of the reel used for winding the skeins in proportion as the winding of the skein increases and in such a manner that during the operation of winding the thread-guides have a continual seesaw motion, so that the exterior circumference of the skein already on the reel is always of the same length as the thread, which is reeled by one reciprocating movement of the thread-guides. Of course the inner layers of thread become loosened by the contraction of the reel-laths, Fig. 4, so that a skein taken off the reel has its outer layers of thread taut, while the inner layers, on the contrary, appear loose and undulating. When the skein is drawn out, the layers of thread change their respective places, and the skein instead of being a ring of small breadth and comparatively great thickness is now a broad ring of reduced thickness. In this way the crossing of the threads likewise vary. While at first the thread is carried backward and forward over the whole width of the skein, after the stretching of the skein the lay of the threads on the ring-like surface is such that the thread alternately touches the inner and outer circumference of the skein, Figs. 6 and 7.

The necessary contraction of the reel-laths for the production of said skein of yarn is brought about by the apparatus shown in Figs. 1 and 2, in which the worm-wheel *d* on cross-piece *e* rotates with the reel-shaft *a* by engaging with the worm *c*, which latter

fits loosely on the said reel-shaft *a* and is fastened to the frame *b*. This sets in motion the worm-wheel *d* and pin *e*, on which is secured a worm *f*, which turns the worm-wheel *g*, likewise the shaft *h*, and consequently worm *i* and worm-wheel *l*, which latter is made with the bevel-wheel *k*. The bevel-wheels *m* and *k* turn on screw-spindles *n*, situated radially with the reel-shaft *a*, and engage with each other, their bosses being arranged with screw-threads to receive the ends of the screw-spindles *n*, which support the reel-laths *o*. The said screw-spindles *n* screw in and out in accordance with the turning one way or the other of the shaft *h*, which latter is made with its end to receive a suitable key or crank for facilitating the turning of the said shaft after loosening the adjusting-screw *g'* on the worm-wheel *g*. Before beginning to reel the yarn the laths *o* require to be placed in their normal position. The radial displacement of the laths *o* can be regulated by making the worm-wheels *d* or *g* of the dimensions desired, according to the number of the yarn, which may be ascertained at any moment by measuring the circumference of the skein (which must always be uniform with skeins of any thickness) by means of a measuring-band.

The tying of the skeins of yarn can take place in various ways. For instance, it can be done during the reeling in such a way that after a certain quantity of yarn is reeled the tying-up cord is wound therearound, and this is repeated until the skein is complete, so that the skein (a section of which is shown tied in

this fashion at *a'*, Fig. 3) is thus divided into several sections corresponding to the leas or numbers of the current market reelings, so the tying of the skein into sections of uniform size, as shown at *a'*, Fig. 5, can take place after the reeling of the complete skein, the individual sections of the skein having been previously separated from each other during the reeling by bands stretched over the whole length of the reel. The ties in this case for holding the skein of yarn intact are not put on until after the skein has been successfully reeled, and thick skein or skeins of valuable yarn are then provided with several ties round them at various parts. (See *b'*, Figs. 3 and 4.) In said Figs. 3 and 4 the position of the cord for tying up is shown before the skein is stretched, while Figs. 5 and 6 show the same after the skein has been stretched.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

An improved yarn skein having the windings of yarn from the inside to the outside of the same length, and having said windings extended from one edge of the skein to the other so as to uniformly cross each other all over the respective layer, substantially as and for the purpose described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

OSWALD HOFFMANN.

Witnesses:

R. HERPICK,
H. GENEHR.