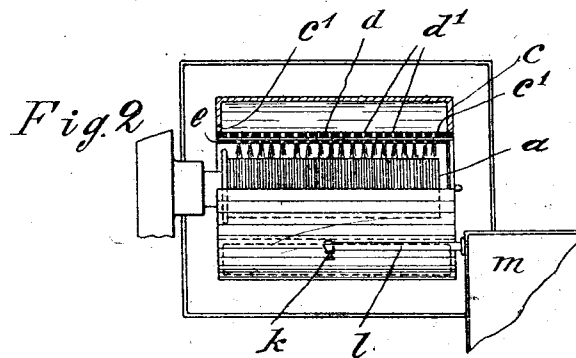
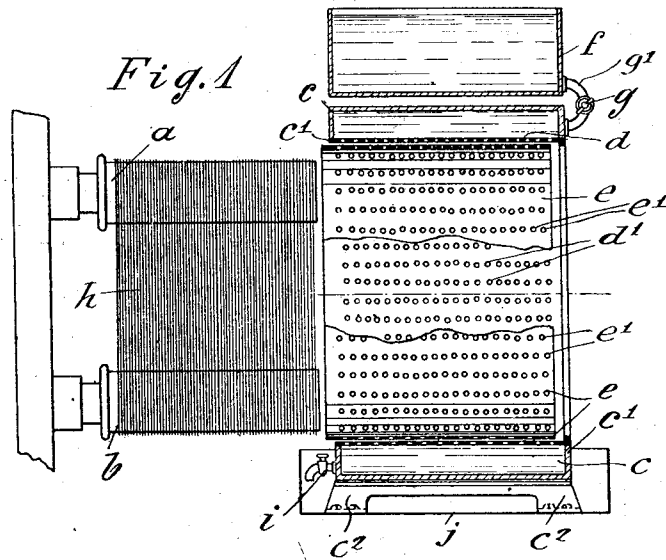


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MACHINE FOR MERCERIZING YARN IN SKEINS.
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1,053,911.

Patented Feb. 18, 1913.



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MACHINE FOR MERCERIZING YARN IN SKEINS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PAUL HAHN, a citizen of the Empire of Germany, residing at Niederlahnstein-on-the-Rhine, in the Empire of Germany, have invented a new and useful Machine for Mercerizing Yarn in Skeins, of which the following is a specification.

The machines hitherto employed for mercerizing yarn in skeins may be classified in two classes. With those of the one kind, which are mostly employed, the skeins of yarn laid around the two stretching rollers are immersed in a horizontal position, the two rollers being arranged in the same horizontal plane, and dip with the skein only so far into the lye or the rinsing water respectively, that only the lower portion of the skein will be covered with the liquid approximately up to the level of the lowermost point of the periphery of the boss of the rollers. With the machines of the second class the two rollers are arranged in a vertical plane and the skein laid around them dips together with the lower, not displaceable roller into the liquid beyond the uppermost point of the periphery of the latter. Both these classes of machines show the same disadvantage, namely that the skein on the rollers considered with regard to the different portions of its length will come in contact with the lye or the rinsing water at such different times, that a considerable difference in the effect of the liquids upon the various portions of the length of the skein will result. The travel of the skein around the rollers must be comparatively slow for insuring a good impregnation with the liquid, it is therefore obvious that the parts of the yarn which first dip into the liquid will immediately begin to shrink under the influence of the lye, while the following parts, which have not yet dipped into the liquid, will be stretched in consequence of the shortening of the length of the skein caused by such shrinking, and this stretching will be the greatest with the portion of the yarn coming last of all in contact with the lye. The part of the yarn dipping first into the lye will therefore absorb under otherwise equal conditions more lye and shrink more than the part dipping last of all into the lye, so that the silky gloss produced in and on the yarn by the action of the lye will be very unequally distributed. Similar effects are also observed at the im-

mersion of the yarn into the rinsing liquid, such as hot water, or on the yarn being sprinkled with the latter. Where the impregnation commences or where the drops of hot water fall first, the effect of the lye will be more conspicuous or will be interrupted more powerfully respectively than elsewhere, so that differences in the appearances of the final product will result, which will also be of great influence upon the subsequent treatment of the yarn, for instance on the dyeing process.

My invention consists of an improved machine for mercerizing yarn in skeins, in which the two rollers, over which a skein is laid, are disposed in the same vertical plane. According to my invention the skein on the two rollers is brought into contact with the respective liquid (lye, rinsing water) at once and all over its length, so that the time of impregnation or rinsing is the same for the whole length, that is the whole skein of yarn is completely and uniformly covered with the lye or the rinsing liquid respectively all over at one time.

I will now proceed to describe my invention with reference to the accompanying drawing, in which—

Figure 1 is a vertical longitudinal section through a part of an improved yarn mercerizing machine, the sprinkling device being moved aside, and Fig. 2 is partly a horizontal section through and partly a plan view of the same, only so much being shown as is sufficient for the understanding of the invention.

The two superposed rollers *a* and *b* can be set to rotate by the machine in any known manner and the lower roller *b* may be mounted on a shaft turning in stationary bearings, while the upper roller *a* may be fastened on a shaft turning in bearings, which can be vertically shifted, so as to move the roller *a* downward for the exchange of the skein and upward for stretching the skein.

The device for sprinkling the yarn is in Fig. 1 shown to be moved away from the two rollers *a* and *b*. It is constructed as follows: A casing *c* having two opposite openings *c'* *c'* in the side walls and being consequently open is closed with a sieve *d* covering its cavity. The sieve *d* has a great number of small holes *d'* *d'* as shown. In the side view the casing *c* therefore looks somewhat like an O. A perforated slide *e*

fits the inside of the sieve *d* and has the same number of holes *e'* *e'* as the latter, so that for the position of the slide *e* shown in Fig. 2 its holes *e'* *e'* register with the holes *d'* *d'* of the sieve *d*, while in the other position shown in Fig. 1 the slide *e* closes the holes *d'* *d'* of the sieve *d*. Any known means could be provided for moving the slide *e* in either direction relatively to the casing *c*. The slide *e* is adapted to completely encircle the skein *h* laid around the two rollers *a* and *b* on the casing *c* being moved into the respective position shown in Fig. 2. Or the casing *c* (which is shown to be provided with feet *c'* *c'* standing on the bottom of a tank *j*) may be stationary and the machine carrying the two rollers *a* and *b* may be arranged for longitudinal motion, so as to move the two rollers *a* and *b* with the skein *h* into the space of the slide *e* and out of the same. Any known means could be provided for effecting this relative motion of the machine or the sprinkling device. The casing *c* may be connected with a tank *f* (omitted from Fig. 2) above by means of a tube *g'* and a cock *g* or the like. The tank *f* may be assumed to contain the lye, while another tank *m* (Fig. 2) above contains the rinsing liquid and may be connected with the casing *c* by means of a tube *l* and a valve *k*. The casing *c* is below provided with a cock *i* opening into the tank *j*. Some pump (not shown) may be provided for constantly raising the liquid from the tank *j* below and discharging it into the tank *f* or *m* above.

It is evident, that after a fresh skein *h* has been put around the two rollers and after the sprinkling device has been moved over the skein or the skein has been moved by the machine into the sprinkling device, as the case may be, and after the casing *c* has been filled with lye from the tank *f* through the tube *g'* and the cock *g*, it is only necessary to so shift the slide *e* as to open the holes *d'* *d'* of the sieve *d*, when the lye will simultaneously emerge under pressure from all the holes *d* *d* and impregnate the rotated skein *h* on all parts of its whole length so intensely and uniformly that a difference in the effect of the lye on the different portions of the skein will be out of question. After the skein *h* has been sprayed

for a sufficiently long time, the slide *e* is shifted back into its initial position for closing the holes *d'* *d'* of the sieve *d*. Then the cock *g* is closed and the cock *i* is opened for discharging the lye from the casing *c*. Afterward the cock *i* is again closed and the casing *c* is filled with the rinsing water from the tank *m* by opening the valve *k*. Thereupon the slide *e* is shifted for opening the holes *d'* *d'* of the sieve *d*, when the skein will be simultaneously sprinkled on all of its parts with rinsing water which will wash off the surplus lye. After the rollers *a* and *b* and with them the skein *h* have been withdrawn from the casing *c* the liquid can be squeezed out and the yarn be further treated in known manners.

The tanks *f* and *m* may be replaced by pumps or other devices.

I claim:

1. In a yarn mercerizing machine, the combination with two superposed rollers adapted to stretch yarn skeins and to be rotated, of a sieve adapted to encircle the yarn skein on said two rollers, a casing surrounding said sieve and adapted to be thereby closed on the inside, and a slide fitting the inside of said sieve and provided with perforations adapted to register with the holes of said sieve in one position and to close the holes in the other position.

2. In a yarn mercerizing machine, the combination with two superposed rollers adapted to stretch yarn skeins and to be rotated around their axes, of a sieve adapted to encircle the yarn skein on said two rollers and to be displaced relatively thereto so as to uncover the yarn skein, a casing surrounding said sieve and adapted to be thereby closed on the inside, a slide fitting the inside of said sieve and adapted to be shifted relatively thereto, said slide having perforations adapted to register with the holes of said sieve in one position and to close the holes in the other position, means for filling said casing with a liquid, and means for discharging the liquid from said casing.

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

PAUL HAHN.

Witnesses:

ADOLPH THELEN,
LOUIS VANDORN.