(No Model.) 3 Sheets—Sheet 1.

E. ZILLESSEN.

MACHINE FOR DYEING YARN.

No. 345,269. Patented July 6, 1886.

Fig. 1.

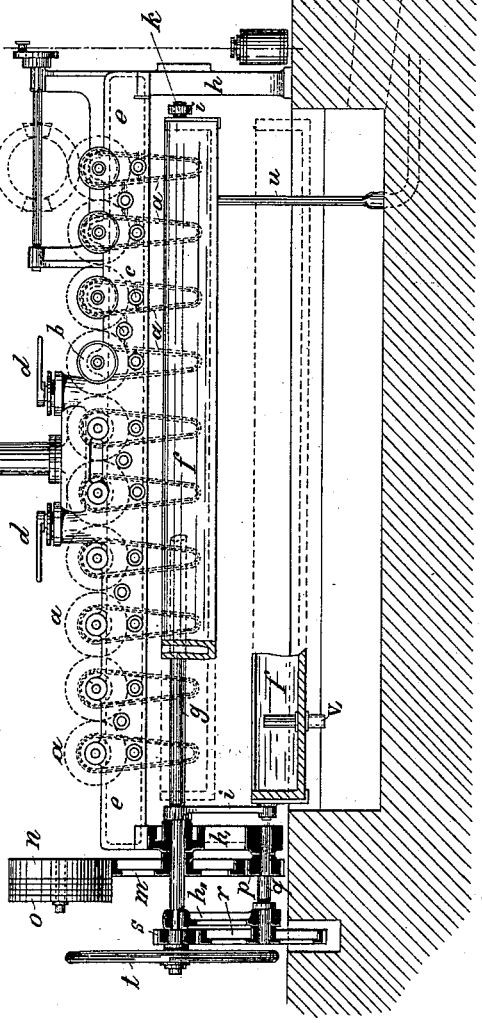
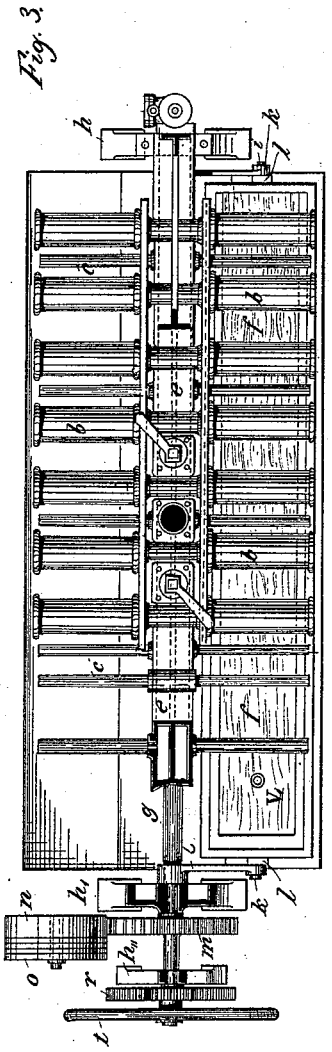


Fig. 3.



Witnesses:
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David S. Williams

Inventor:
Ernst Zillessen,
by his Attorneys
Howson & Sons

(No Model.) 3 Sheets—Sheet 2.

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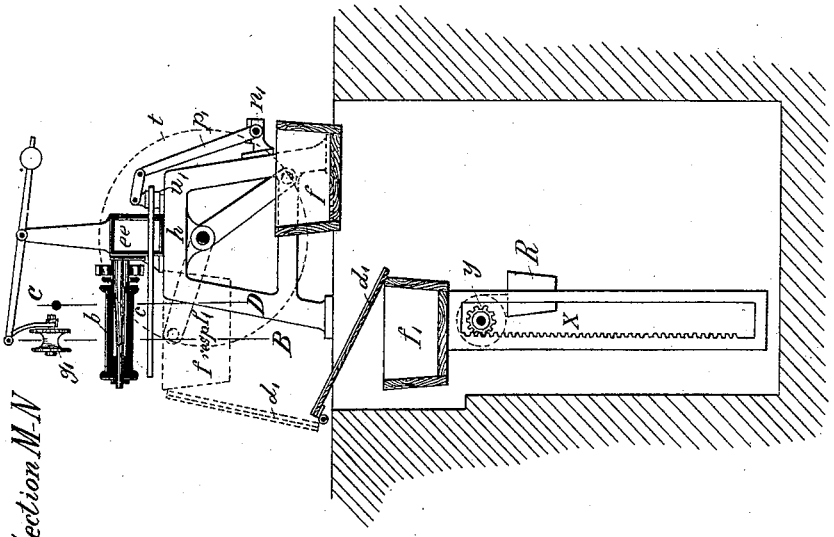
Fig. 6.



Section M N

Fig. 2.

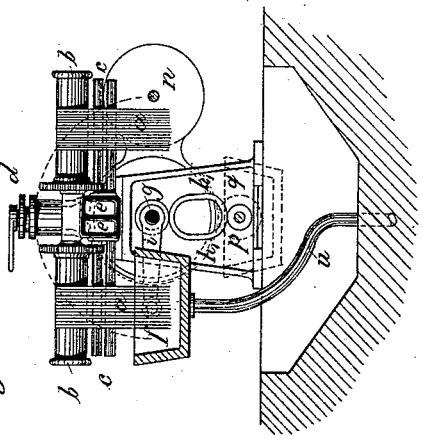
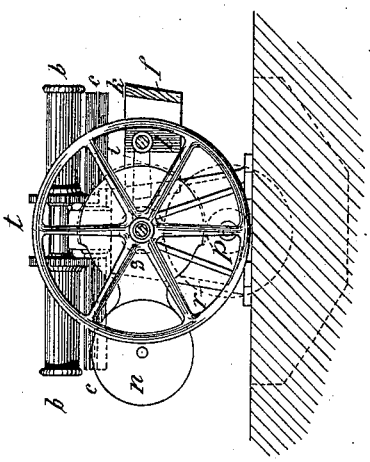


Fig. 4.



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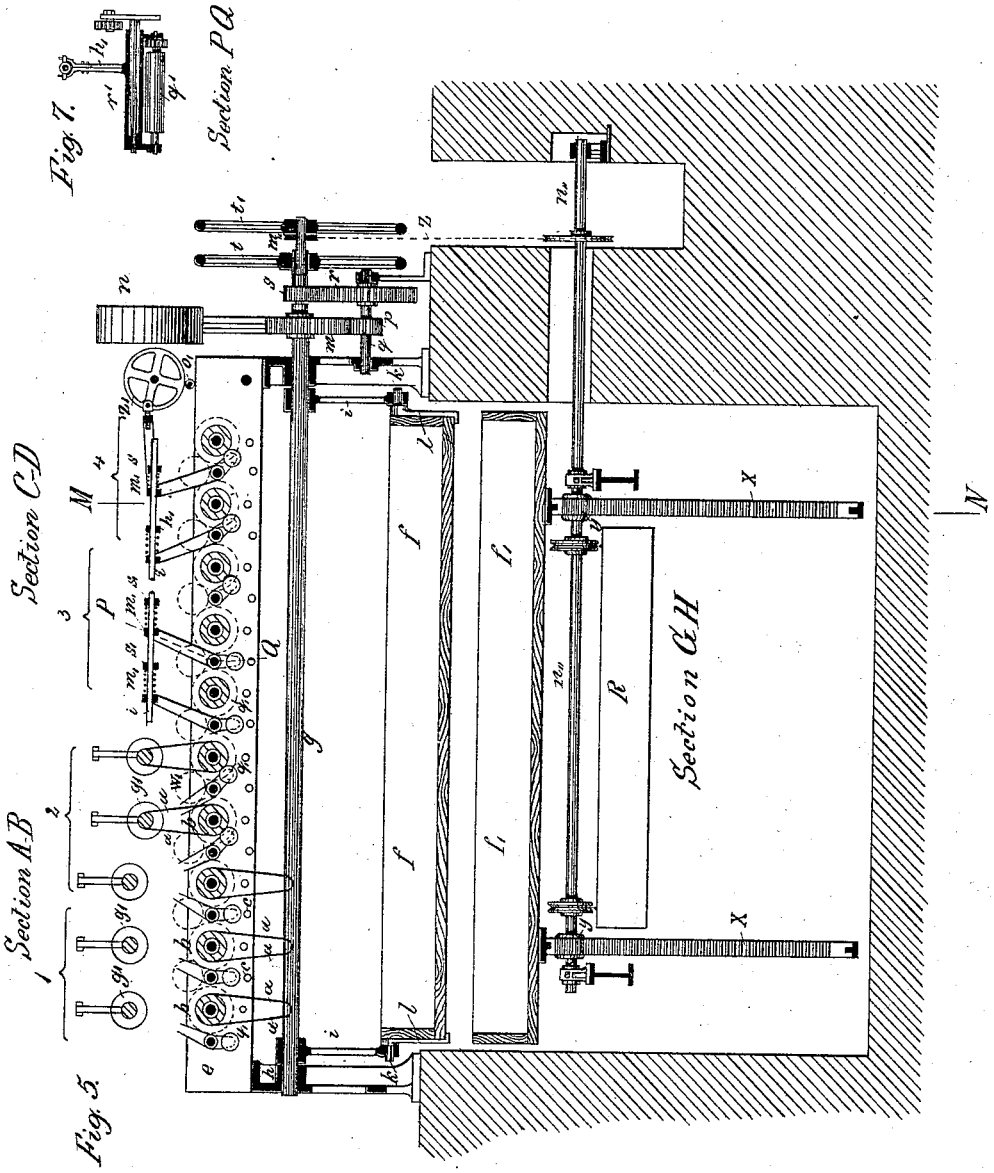

Witnesses:
John E. Parker
David S. Williams

Inventor:
Ernst Zillessen
by his Attorneys.
Howson & Sons

UNITED STATES PATENT OFFICE.

ERNST ZILLESSEN, OF CREFELD, PRUSSIA, GERMANY.

MACHINE FOR DYEING YARN.

SPECIFICATION forming part of Letters Patent No. 345,269, dated July 6, 1886.

Application filed November 19, 1885. Serial No. 183,332. (No model.) Patented in Germany July 5, 1883, No. 25,890, December 23, 1884, No. 32,482, and February 28, 1885, No. 32,554.

To all whom it may concern:

Be it known that I, ERNST ZILLESSEN, a subject of the Emperor of Germany, residing at Crefeld, in the Kingdom of Prussia, Germany, have invented certain Improvements in Machines for Washing and Dyeing Yarns, of which the following is a specification.

The object of my invention is to construct a machine for the thorough and efficient washing of yarns in the hank or skein, and also for wringing, squeezing, and pressing the hanks which have been washed and dyed without the removal of the hanks from the reels. This object I attain in the manner which I will now proceed to describe.

In the accompanying drawings, Figure 1 is a longitudinal side view, partly in section, of one form of my improved apparatus, in which the hanks may be treated on opposite sides of the machine. Fig. 2 is a vertical section on the line A B, Fig. 1. Fig. 3 is a plan view, also partly in section. Fig. 4 is an end view of the gearing for operating the tanks. Fig. 5 is a longitudinal section of one of my single machines. Fig. 6 is a transverse section of the same; and Fig. 7 is a detached view of the device for squeezing the hanks.

The hanks *a* of yarn are hung over a number of reels, *b b*, which are adapted to turn in bearings in the horizontal hollow reel-frame *c*, which is carried by suitable standards. The longitudinal reel-frame *c* is hollow, and divided longitudinally by a central partition, and from the chambers thus formed on each side project laterally in line with the reels *b*, and below the same, perforated tubes *c*, in such position that they will lie within the pendent hanks, as illustrated in Fig. 1. Water is supplied to the two chambers in the hollow reel-frame through a suitable pipe, *d'*, and the supply to each chamber is controlled by a valve, *d*, (Figs. 1 and 2,) so that water can be supplied to either or both chambers, as may be found desirable. Rotary motion may be imparted to the reel by any suitable gearing, and as the hanks are thereby rotated the water introduced to the chambers in the hollow frame *c* will be ejected through the perforated pipes *c* onto the traveling hanks of yarn to thoroughly wash the same. By preference I use cold water for the washing, and when it is desired to subject the hanks to the action of warm water, or of a dyeing or mordanting solution, I make use of the movable tank or tanks *f*, which I will now describe. The tank *f* extends longitudinally of the frame, and is adapted to be raised up to the hanks, so that the lower parts of the latter, as they are turned by their reels, are immersed in the liquid in the tanks, and washed, dyed, or mordanted thereby. Each tank *f* is supported at opposite ends by arms *i*, carried by a horizontal shaft, *g*, adapted to bearings in the posts *h h* of the frame. Each tank is provided at opposite ends with plates *l*, having pivot-pins *k*, adapted to bearings in the ends of the arms *i*. The shaft *g* carries a wheel, *m*, provided on a portion of its circumference with teeth, and on the opposite side with a counter-weight, *n*, which may be cast therewith, and may also be adapted to receive additional weight-disks *o* where necessary. By means of this wheel it will be seen, as illustrated in Fig. 2, that the tank may be raised up to or moved away from the suspended hanks, and for this purpose a hand-wheel, *t*, may be provided to move the shaft *g* directly; but I prefer to provide intermediate gearing, *p r s*, as may be found convenient. By means of this gearing and the counter-weight the somewhat heavy tank may be moved very easily from one side of the machine to the other.

The warm water or dyeing or mordanting solution may be introduced into the tank through an india-rubber pipe, *u*, adapted to a nozzle in the bottom of the tank, and an overflow-pipe, *v'*, is provided, through which the excess of liquid can escape into the collecting-trough below. I prefer to so balance the tank that it will slightly outweigh the counter-balance *n*, so that it will firmly rest in its lower position to permit the washing of the hanks from either side of the machine, and to permit the supply of water through the perforated pipes *c*. When it is desired to use the warm water or dye or mordant, the tank is raised, and it may be maintained in this raised position by a suitable contrivance, such as pawl and ratchet or supporting-chains.

In the machine illustrated in Figs. 5 and 6

there is a tank, *f*, similar to that described, to be raised up to or lowered away from the suspended hanks by means of the shaft and gearing before set forth; and I prefer also to supply a second tank, *f'*, which is contained in the pit below the machine, and which is capable of being raised and lowered vertically to or from the hanks when the tank *f* is moved out of the way. The mechanism for accomplishing this is shown in the drawings, and consists of vertical racks *x*, carrying the tank *f'*, and gearing into pinions *y* on a shaft, n^2, Fig. 5, mounted in suitable bearings. This shaft n^2 is provided with pulleys, from which are suspended suitable counter-weights, R, and also carries a chain-wheel, over which passes a chain, *z*, gearing into a corresponding wheel, m^2, on the shaft *g*, so that the said shaft n^2 may be turned from the shaft *g*, and through its pinions *y* can raise or lower the tank *f'*. When the tank is in its depressed position, as illustrated in Fig. 6, while the rinsing or warm-water-washing processes are in progress, the said tank *f'*, which is intended to contain the dye or mordant, is covered by a removable cover, *d'*, hinged at its upper edge, so that as the said dye-tank *f'* is raised it will be thrown up to the position indicated by dotted lines in Fig. 6, where it lies against the side of the tank, and thus offers a lateral protection to the latter. As the tank *f'* is intended to contain the dye or mordant in solution, the cover *d'*, when the tank is in the depressed position, prevents the water or dirt from the washing process flowing into the tank and diluting or adulterating the solution. The devices for raising and lowering the tank may, however, be constructed in various ways without departing from my invention. In some cases I may combine with the above-described mechanism devices for wringing, squeezing, or pressing the hanks which have been treated in the mordanting and dyeing vats, and these devices are of more especial use where the dyeing, mordanting, and washing processes are to be carried out quickly one after the other, or where the mordant-vat has to be frequently replaced by a dyeing-vat. These wringing or squeezing devices are illustrated in Figs. 5, 6, and 7, and consist of rollers *g'*, suspended from suitable balanced arms over the rollers or reels *b*, so that when the bath is finished the hanks are lifted up over the rollers *g'* and are stretched by means of the counter-weights, and adjacent to each of the rollers *b* is a cylinder, *q*, which presses firmly against the roller or reel *b* and the hank thereon. Said cylinder *q* is carried by an arm of a bent lever on the shaft. The arm *h'* of this lever has a bearing at its upper end, through which passes the rod *i*. A spring, *m'*, between an adjustable regulating-collar, *s'*, on the rod and the said bearing, tends to press the cylinder *q* against the hanks on the reels *b*. These reels *b* being rotated at this time all parts of the traveling hank will be subjected to the squeezing operation. The disk *z'*, which acts on the longitudinal rod *i* to regulate the pressure of the cylinder *q*, may be adjusted according to the pressure desired.

I claim as my invention—

1. A yarn washing, dyeing, or mordanting machine provided with a movable tank, *f*, as and for the purpose set forth.

2. The combination of the frame and hank-reels adapted to carry the hanks, with a longitudinal shaft having arms carrying a tank, whereby the latter may be moved up to or away from the said tanks.

3. The combination of a frame having hank-reels on opposite sides, with a central longitudinal shaft carrying arms, and a tank pivoted to said arms, whereby the said tank may be moved up to the hanks on either set of reels.

4. The combination of the frame carrying hank-reels, with a shaft having arms, a tank pivoted to said arms, and a counter-weight on the shaft.

5. The combination of the frame having hank-reels, and a shaft having arms, with a tank pivoted to the said arms, a counter-weighted wheel on the said shaft, gearing, and hand-wheel *t*.

6. The combination of a frame carrying hank-reels, and a shaft having arms carrying a pivoted tank, *f*, with a vertically-moving tank, *f'*, below the hank-reels, substantially as described.

7. The combination of the frame carrying hank-reels and dyeing or washing tanks, with rollers *g'* over the reels, and counterbalanced arms from which the said rollers are suspended, substantially as described.

8. The combination of the frame carrying hank-reels, with a vertically-moving tank, *f'*, below the said reels, and a pivoted cover, *d'*, for the tank, substantially as and for the purpose set forth.

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

ERNST ZILLESSEN. [L. S.]

Witnesses:

CARL FAEZNER,

L. HUENGES.