June 20, 1933. P. W. CÜSTERS 1,914,488

MACHINE FOR MOISTENING AND COOLING YARNS AND FABRICS

Filed Sept. 19, 1931

Fig. 1.

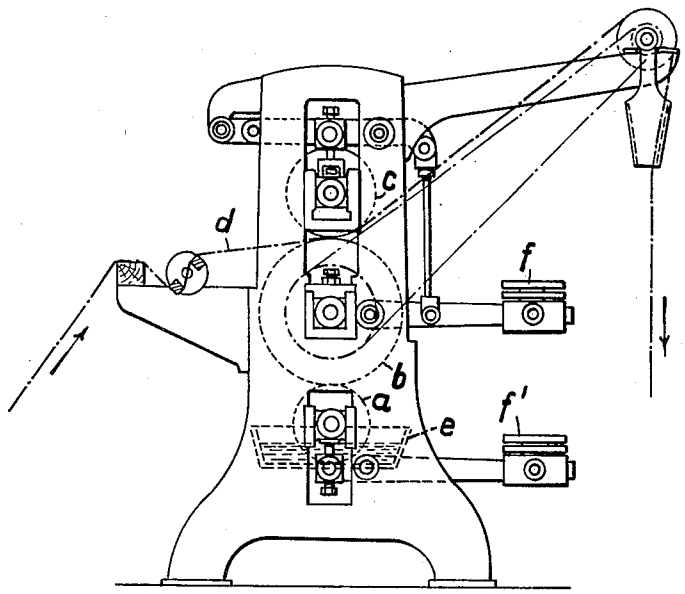
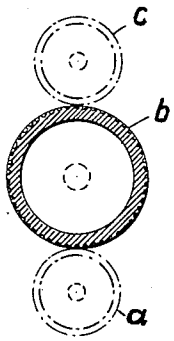


Fig. 3.



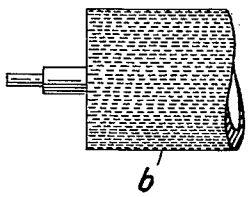


Fig. 2a.

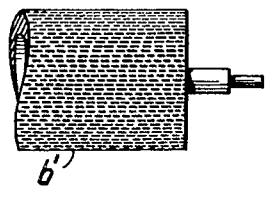


Fig. 2b.

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Patented June 20, 1933

1,914,488

UNITED STATES PATENT OFFICE

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MACHINE FOR MOISTENING AND COOLING YARNS AND FABRICS

Application filed September 19, 1931, Serial No. 563,800, and in Germany October 28, 1930.

This invention relates to a machine for moistening and cooling yarns and fabrics by means of three superposed rotatable rolls, the lowermost of which is partly submerged in liquid, supplies this liquid to the middle roll running above it, whereas the uppermost roll serves as a pressure roll for pressing the liquid into the material conducted between the uppermost roll and the middle roll.

It is known to construct in such machines one or more of the rolls elastic and as lever loaded pressing roll, and to provide the lowermost applying roll with engraving. All these measures however serve merely to facilitate the application of the treating medium, whereas in the known construction they were neither provided nor suitable for enabling a fine adjustment of the application according to the actual kind of material and to the actual requirements, in the sense that the quantity of the liquid feed to the web conducted through the upper roll gap is adjustable, both as regards the quantities of treating medium supplied and also as regards the quantities of the treating medium squeezed out, namely independently the one of the other.

This object is attained for the first time by the present invention in that an elastic applying roll is arranged under a middle engraved roll and a similar elastic roll above the same, two of the three rolls being adjustably loaded for pressing the liquid into or squeezing it out of the middle roll.

The arrangement may be such that one of the three rolls is stationary so that the two remaining rolls act as pressing on rolls.

A particularly advantageous form of construction is illustrated by way of example in the accompanying drawing, in which construction the engraved middle roll is stationary, whereas the upper and lower rolls provided with extensible, preferably rubber laggings are adapted to be adjustably pressed against the middle roll by lever loading, the pressing on pressure of the two rolls occurring independently the one of the other.

In the accompanying drawing:

Fig. 1 shows the machine in side elevation.

Figs. 2*a* and 2*b* show two forms of engraving of the middle roll.

Fig. 3 is a vertical section, particularly through the middle roll.

A middle roll *b*, which in the example illustrated is stationary, is provided according to the invention with engraving, and a roll *a* under the roll *b* dips into a vessel *e*, a squeezing roll *c* being arranged above the roll *b*. The rolls *a* and *c* are elastic in that they are made of rubber or have an elastic or rubber lagging, and they are pressed independently against the engraved middle roll *b* by levers provided with adjustable weights *f* and *f'* respectively. The middle roll *b* may be engraved, as illustrated in Figs. 2*a* and 2*b*, or in any other suitable manner.

The operation of the machine is as follows:

The submerged roll *a* transfers more or less dressing liquid to the engraved middle roll *b* being adjustable, as desired, by its lighter or heavier pressure. The dressing liquid is supplied absolutely uniformly to the material *d* passing through the machine by this engraved middle roll *b*, and the material is conducted between the engraved middle roll *b* and the upper pressure roll *c* for the purpose of taking up the dressing liquid, so that it absorbs the liquid on the engraved middle roll *b*, owing to the pressure of the upper roll *c*. Owing to the different pressure exerted by the lower submerged roll and the upper pressure roll against the middle roll more or less dressing liquid is taken up by the material passing through, it being possible to further finely regulate the quantity of liquid according to the kind of fabric to be treated by making the engraving on the middle roll *b* coarser or finer.

I claim:

A machine for moistening and cooling yarns and fabrics, comprising a middle engraved roll, pressure rolls with resilient lagging arranged one above and the other below said middle roll, and adjustably weighted levers adapted to independently press said pressure rolls against said middle roll to accurately regulate the quantity of moisture supplied by said lower pressure roll to said middle and consequently by said middle

roll to the material passing through the gap between said middle roll and said upper pressure cylinder and also the quantity of liquid squeezed out of the material by the pressure exerted on the material by said upper roll on said middle roll.

In testimony whereof I affix my signature.

PETER WILHELM CÜSTERS.