

No. 634,307.

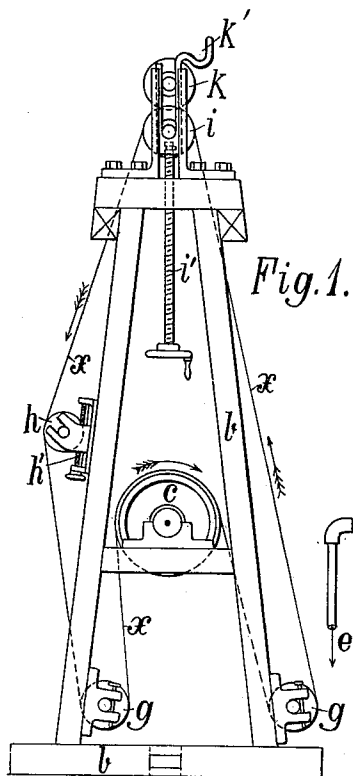
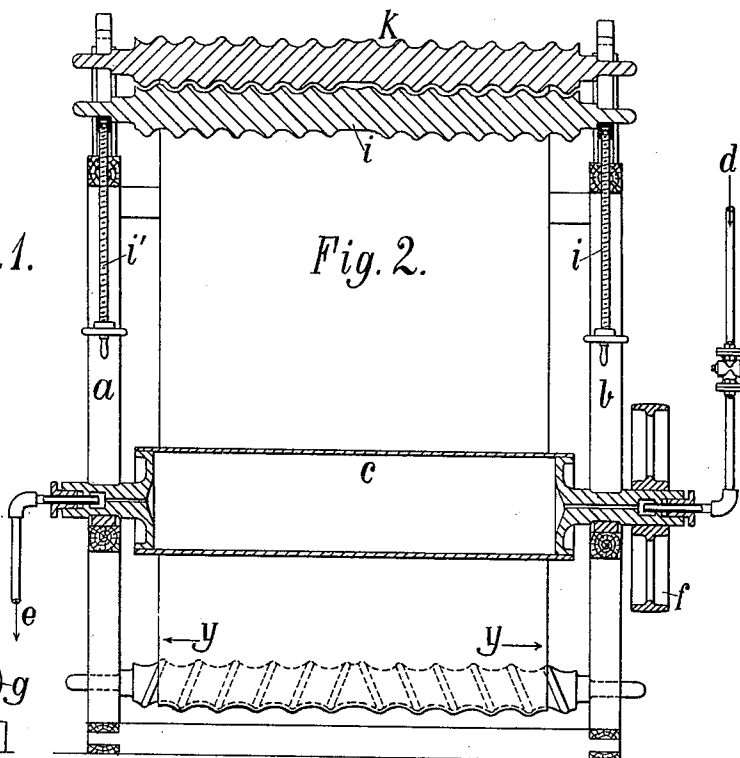
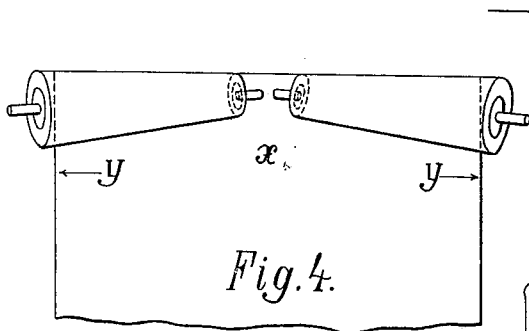
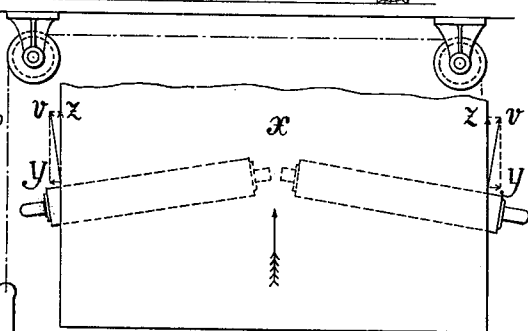
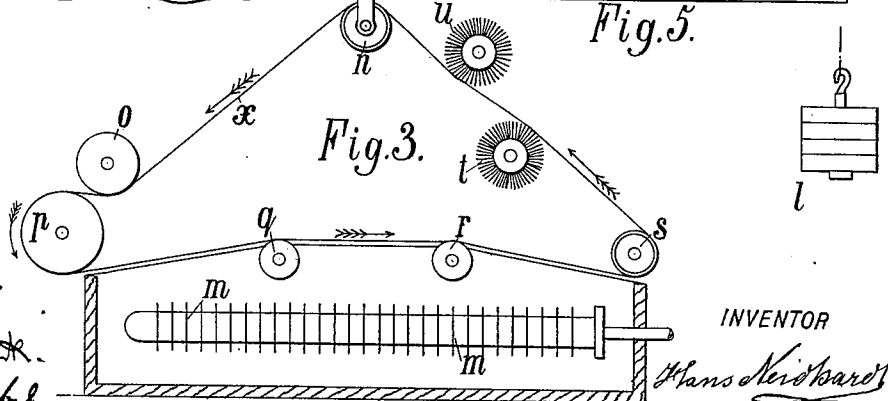
Patented Oct, 3, 1899.

H. NEIDHARDT.

APPARATUS FOR DRYING WET FELTS OF PAPER MAKING MACHINES.

(Application filed June 28, 1899.)

(No Model.)



WITNESSES:

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APPARATUS FOR DRYING WET FELTS OF PAPER-MAKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 634,307, dated October 3, 1899.

Application filed June 23, 1899. Serial No. 722,175. (No model.)

To all whom it may concern:

Be it known that I, HANS NEIDHARDT, a subject of the King of Saxony, residing at Chemnitz, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in Apparatus for Drying the Wet Felts of Paper-Making Machines, of which the following is a specification.

The wet felts used for long wire and cylinder machines are after washing usually dried by hanging them on rods either in the open air or in closed rooms, and are there left until the condensed moisture is entirely evaporated. As this goes on very slowly, taking two or three days in summer and four to six days during the other seasons of the year, the fabric loses its strength, and the time during which it may be used decreases considerably after each drying. A circumstance also contributing to the early wearing out of the felt is that the fabric continuously becomes longer and narrower on the paper-machine, the original square meshes becoming more and more contracted and progressively diminishing the rapidity or extent of absorption of water from the paper. This inconvenience may be overcome by means of an apparatus forming the subject of the present invention, which not only dries felt in the shortest time, but also stretches the material in the direction of the breadth. By this means the injurious influence of moisture on the woolen fabric is obviated and the meshes are opened anew for the transfusion of the water. Moreover, the fabric remains cleaner, since it becomes impossible for as much dust or the like to accumulate as when hung in the open air for days.

In the accompanying drawings, Figure 1 is a side elevation of one form of my invention. Fig. 2 is a vertical longitudinal section. Fig. 3 is a side elevation of a modified form of the invention, and Figs. 4 and 5 are modified forms of the means for stretching the felts transversely.

A series of rollers are mounted free in the two side walls *ab* of the frame, Figs. 1 and 2, one of which, roller *c*, remains constantly in its bearings, while the other rollers, *g h i k*, of which *i* and *k* are the uppermost, can be taken out to enable the felt *x* to be replaced by another. The upper pair of rollers *i k* are furthermore adjustable in a vertical direction,

so as to render the apparatus suitable for felt of various lengths.

The roller *c* consists of a bronze shell with an interior lining of cast-iron. Means are provided for heating it by steam, the inlet being at *d* and the outlet at *e*, and it is driven by means of the belt-pulley *f*.

g i k are stretching-rollers, and *h* is a guide-roller. The stretching-rollers *g* and *i* are provided with spiral metallic ribs or grooves on their periphery, these ribs or grooves starting from the middle of the roller and running in opposite directions and twist toward the ends, the result of which is that a piece of cloth or fabric passed over this part of such rollers is subjected to a strong transverse pull or tension. The same purpose is served by the rollers shown diagrammatically in Figs. 4 and 5. Two conical rollers are shown in Fig. 4, tapering inward to the center. Use is here made of the well-known phenomenon that a band—in this case the wide felt *x*—tends to move toward the thicker part of the roller. As this action takes place at the same time in both rollers the desired stretching of the felt is effected in the direction indicated by the arrows *y*. A similar thing occurs in the arrangement given in Fig. 5, where two rollers engage under the stretched fabric *x* in such a manner that their axes of rotation are arranged so as to inclose an obtuse angle. The friction between the periphery of the rollers and the fabric forces the latter to run off in a direction at right angles to the axes of the rollers. The parallelogram of forces *y v z* shows that thereby a force *y* is generated, which serves to stretch the fabric *x* out laterally. To still further insure this stretching of the felt in a transverse direction, (direction of the weft,) a weighting-roller *K* is placed on the upper roller *i*, Figs. 1 and 2, the periphery of roller *K* being provided with spiral grooves corresponding with the projecting (right and left handed) spiral ribs on roller *i*. By this means the felt fed between the two rollers is strongly forced to stretch to the right and left in accordance with the opposed direction of the spirals. In order to prevent any tendency of the fabric to draw laterally in a slanting direction, the guide-roller *h* is provided, and it can, if necessary, be adjusted somewhat on a slant by means

of the set-screw *h'*. As already stated, the upper pair of rollers *i k* is adjustable vertically, this being effected by the set-screws *i'*. On taking out the rollers they may be temporarily supported on the rest *h'* at the upper end of the frame.

The felt stretching and drying machine shown in Fig. 3 differs from those already described in that the drying-cylinder is replaced by a heating-pipe *m m*, situated under the felt cloth, and the stretching of the fabric in the direction of the warp is effected automatically by the weight *l* by the latter exerting a continuous upward draft on a spirally grooved or ribbed roller *n*. In place of the heating-pipe other forms of heating bodies can of course be used, such as hot air, which rises from underneath the felt or cloth.

The rollers *n o p q r s* have in general the same form and use as the rollers *g h i k* in Figs. 1, 2, 4, and 5.

Both in the arrangement shown in Figs. 1 and 2 and that in Fig. 3 an appliance consisting of roller-brushes or cylindrical cards *t u* can be interposed with the object of exercising a loosening action on the surface of the fabric, so that the small hairs on the surface of the felt that have been twisted and entwined during the using of the felt in the paper-machine are again straightened, and so do not close the pores of the fabric.

The mode of working the improved apparatus culminates, as can be seen, in the restoration of the felt, which while in use in the paper-machine has become impenetrable and wet to a condition as closely as possible resembling that of new felt, which, as is well known, is loosely woven from coarse woolen yarn and is neither raised nor shorn. It is

just this loosely-woven structure that is of special value for the satisfactory action of the felt, since it is desirable that the felt should be in a high degree permeable to water. In order to restore this permeability to the used felt, it is not sufficient to dry and stretch the material, but the fabric must be subjected to a very frequently repeated stretching and releasing during the drying process. Only in this manner can a uniform loosening of the fabric be attained.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus for drying wet endless felts of paper-making machines, the combination with a source of heat, and means for conducting the endless felts so as to be dried, such means being constructed to permit the removal therefrom and the training thereover of the endless felts, of means for stretching the felts transversely and continuously as they pass along, substantially as set forth.

2. In an apparatus for drying wet endless felts of paper-making machines, the combination with removably-supported rollers over which the endless felts are trained, and a stationary drying-roller provided with suitable means for heating it, of removable means for continuously and transversely stretching the felts, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HANS NEIDHARDT.

Witnesses:

BERNHARD BLOMK,
EUGEN CABEL.