No. 872,777. PATENTED DEC. 3, 1907.

F. C. WICKEL.

APPARATUS FOR COLORING ROLL PAPER AND THE LIKE.

APPLICATION FILED OCT. 3, 1905.

Fig. 1.

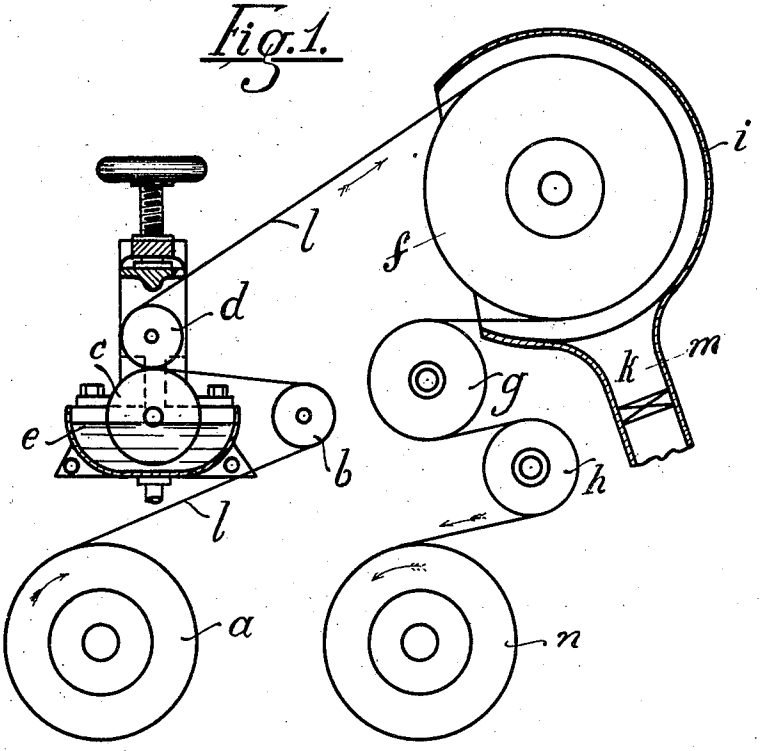
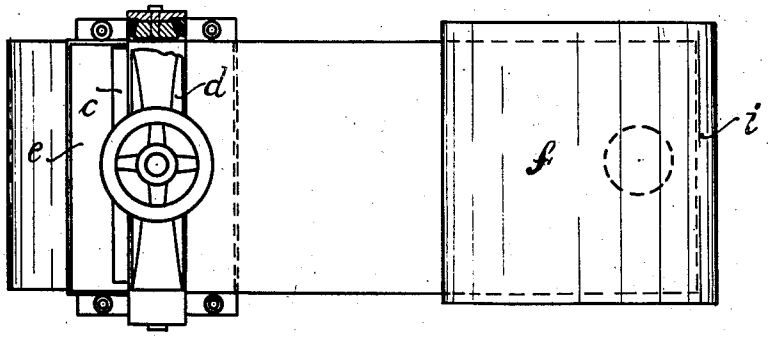


Fig. 2.



Witnesses:
E. O. Niedebrandt
M. F. Anderson

Inventor:
Fritz C. Wickel
by Georgia Massie
Attorney

UNITED STATES PATENT OFFICE.

FRITZ C. WICKEL, OF NUREMBERG, GERMANY.

APPARATUS FOR COLORING ROLL-PAPER AND THE LIKE.

No. 872,777. Specification of Letters Patent. Patented Dec. 3, 1907.

Application filed October 3, 1905. Serial No. 281,134.

To all whom it may concern:

Be it known that I, FRITZ C. WICKEL, a citizen of the Empire of Germany, residing at Nuremberg, in the Empire of Germany, have invented a new and useful Apparatus for Coloring Roll-Paper and the Like, of which the following is a specification.

My invention relates to a method of applying to one side of roll-paper or roll-fabric a coating or film of color of a uniform thickness, whereby the production of the so colored roll-paper or roll-fabric is considerably increased and the process is accelerated without the aid of large drying plants. The color is added to a solution of a gum such as resin in spirit and this mixture is applied to the roll-paper or roll-fabric and dried by the evaporation of the spirit, which evaporation is accelerated by passing the roll-paper or roll-fabric over a heated cylinder. The hot resin-film on the roll-paper or roll-fabric formed by this drying process is, however, not solid, but soft and sticky owing to the high temperature. In order to be able to quickly wind on rollers the colored roll-paper or roll-fabric, the latter is passed over a cooling cylinder to cool the resin-film, which now becomes solid.

My invention also relates to an apparatus for carrying out the new method, which will be hereinafter described with reference to the accompanying drawing, in which—

Figure 1. shows diagrammatically the apparatus in a vertical longitudinal section, and Fig. 2 is a plan of the same, partly in section.

Similar letters of reference refer to similar parts in both views.

a denotes a roll, from which the roll-paper or roll-fabric *l* to be colored is unwound. This roll-paper or roll-fabric *l* is led over a guiding roller *b* and is passed between a pair of rolls *c* and *d*, of which the lower roll *c* dips in a color-box *e* of any known construction and serves for coloring one side of the roll-paper or roll-fabric *l*. The upper roll *d* is made of an elastic material and serves for pressing the roll-paper or roll-fabric *l* on the coloring roll *c*, so that the excess of the color taken along by the latter is constantly pressed out, in order to produce a uniform coating or film of color on the roll-paper or roll-fabric *l*. The mixture of the color with the solution of resin in spirit is introduced into the color-box *e* in any known manner. As the spirit is volatile and rapidly evaporates, the solution will thicken in proportion. In order to obtain nevertheless a coating or film of resin and color of a uniform thickness throughout on the roll-paper or roll-fabric *l*, the pressure between the two rolls *c* and *d* is gradually increased by means of known devices and in proportion to the increasing concentration of the solution. Thereby of course the thickness of the wet coating or film deposited on the web *l* will vary and in inverse ratio to the concentration of the solution. In consequence of this the thickness of the coating or film on the finished roll-paper or roll-fabric will be uniform throughout.

f denotes a drying cylinder of any known construction, which is preferably heated by steam. This drying cylinder *f* is mostly surrounded with a casing *i* for collecting the spirit-vapor. As the latter has a greater specific weight than the ambient air and sinks down, the casing *i* requires to be tight in its lower part, while its upper part may be broken. The casing *i* is at the bottom connected with a tube *m*, through which the spirit-vapor can escape. Preferably an exhauster *k* of any known construction may be disposed in the tube *m* or connected therewith. The exhausted spirit-vapor may be afterwards recovered in any known manner.

q denotes a cooling cylinder of any known construction and arranged to be cooled for example by means of cold water passing through it.

h is a guiding roller and *n* is a roll, on which the finished roll-paper or roll-fabric is wound.

The method is as follows: The mixture formed by the addition of the color to a solution of resin in spirit is placed in the color-box *e* and the roll-paper or roll-fabric *l* is drawn in the usual manner from the roll *a* over the guiding roller *b*, between the two rolls *c* and *d*, over the heated cylinder *f*, the cooling cylinder *g* and the guiding roller *h* to the roll *n*. The pressure on the upper press roll *d* is adjusted for the proper thickness of the wet color coating or film at the beginning and in the course of the process this pressure is increased in the manner explained above. The excess of the mixture pressed out by the upper roll *d* returns to the color-box *e* and the roll-paper or roll-fabric *l* with the coating or film of mixture upon it passes upwards, while already a small part of the spirit in the mixture evaporates. The greater part of the

spirit, however, evaporates during the passage of the roll-paper or roll-fabric *l* with its face outwards over the drying cylinder *f*. On leaving the drying cylinder *f* the roll-paper or roll-fabric *l* with its coating or film will be warm or hot and the latter will be freed from all spirit, but still be soft and sticky. During the passage of the roll-paper or roll-fabric *l* over the cooling cylinder *g* its coating or film will come in contact with the latter and be cooled thereby. On leaving the cooling cylinder *g* the color coating or film will be quite solid and fastened on the paper or fabric *l*, so that the latter after the passage over the guiding roller *h* can be at once wound on the roll *n* and carried off for use or sale.

This method presents the important advantage, that about 4000 meters per hour of roll-paper or roll-fabric can be covered on the face with a coating or film of color, while in the other known methods not more than 1200 meters at the outside of the roll-paper or roll-fabric can be coated in the same time.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an apparatus for coloring fabric, the combination, of a color box, a color roll arranged above the box with its lower side dipping below the level of the color solution therein, a pressure roll arranged above and closely adjacent to the color roll, adjustable means for forcing the pressure roll toward the color roll, a heating drum, a vapor collecting device operatively arranged relative to the surface of the heating drum, a cooling drum, means for applying heat to the heating drum, means for refrigerating the cooling drum, and means for drawing the fabric successively between the color roll and the pressure roll and over the heating drum and the cooling drum.

2. In an apparatus for coloring fabric, the combination, with a color box, of a color roll arranged above the box with its lower side dipping below the level of the color solution therein, a pressure roll arranged above and bearing upon the color roll, means for adjustably varying the pressure between said pair of rolls, a heating drum, means for heating the said drum, a hood surrounding said heating drum and provided with an exit passage leading therefrom, a cooling drum, means for refrigerating the cooling drum, a feed roll for the uncolored fabric, a receiving roll for the colored roll, and means for driving said feed and receiving rolls.

3. In an apparatus for coloring fabric, the combination, with a color box, of a color roll arranged above the box with its lower side dipping below the level of the color solution therein, a pressure roll arranged above and bearing upon the color roll, means for adjustably varying the pressure between said pair of rolls, a heating drum, means for heating the said drum, a hood surrounding said heating drum and provided with an exit passage leading therefrom, an exhaust device arranged in said passage, a feed roll for the uncolored fabric, a receiving roll for the colored fabric, means for driving the feed roll and receiving roll, and guide rolls arranged to direct the fabric between the color roll and pressure roll and over the heating roll with its colored side outward and over the cooling roll with its colored side inward.

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

FRITZ C. WICKEL.

Witnesses:

WILHELM HIMER,

OSCAR BOCK.