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F. C. WICKEL.

METHOD AND APPARATUS FOR COATING BANDS OF FABRIC.

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Fig. 1.

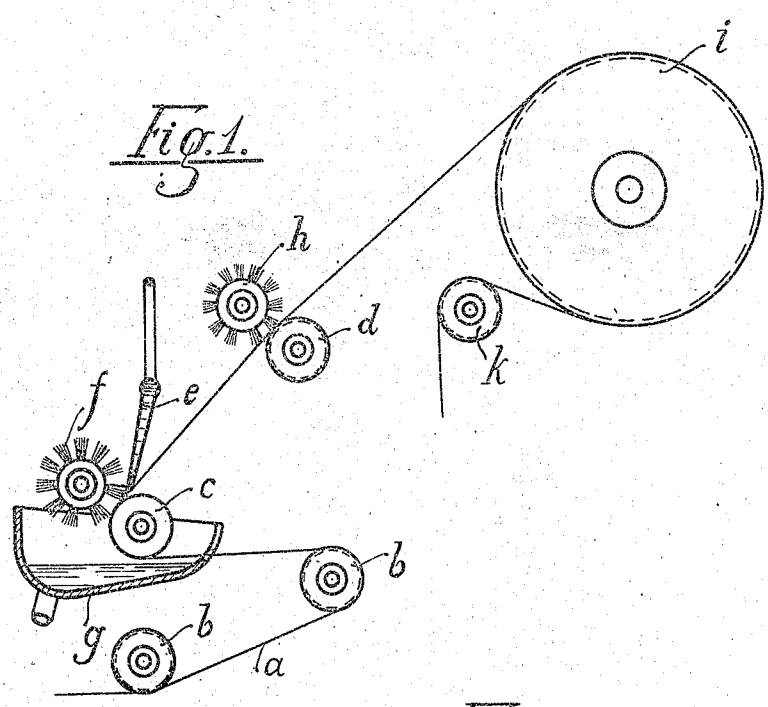
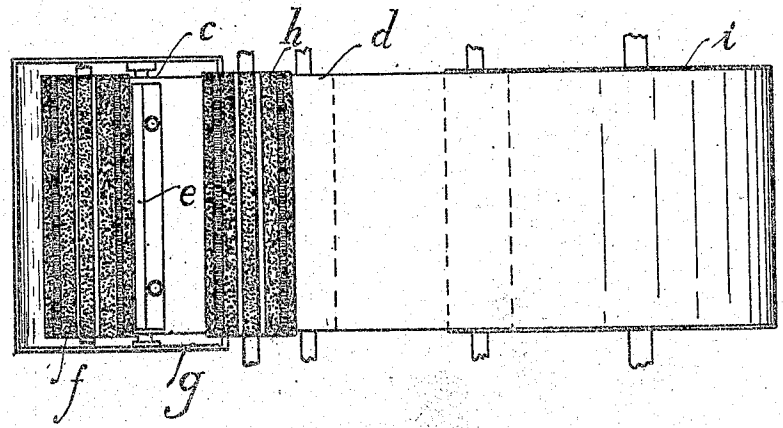


Fig. 2.



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METHOD AND APPARATUS FOR COATING BANDS OF FABRIC.

No. 815,664. Specification of Letters Patent. Patented March 20, 1906.

Application filed October 3, 1905. Serial No. 281,135.

To all whom it may concern:

Be it known that I, FRITZ C. WICKEL, director, a subject of the German Emperor, residing at Nuremberg, Bavaria, Germany, have invented new and useful Improvements in Methods and Apparatus for Coating Bands of Fabric, of which the following is a specification.

In the carrying out on a manufacturing scale of the well-known method of forming a metallic-powder coating on bands of paper or fabric by means of a layer of resin a product hitherto resulted, as a rule, in which only the lowermost layer of the metallic powder adhered firmly, while the upper layer of the metallic powder rested only loosely thereon and came off on contact. The complete removal of this loose part by mechanical contrivances of any kind—such, for instance, as brushing or wiping apparatus—in such a way that the product shows a uniform surface condition has not hitherto been successfully done.

Now this invention has for its object to allow of the manufacture on a large scale of paper or fabric bands having a firmly-adherent and entirely uniformly distributed coating of metallic powder. It is based on the fundamental idea of removing as far as possible the loosely-adherent part of the metallic-powder layer and firmly combining the remainder with the already firmly-adherent part, and thereby with the foundation of paper or fabric itself. This idea is practically carried out by the surplus metallic powder being removed by water with the assistance of rotary brush-cylinders, and then the greater part of the layer of water remaining on the washed surface further taken up by other rollers, and then the band of paper or fabric fully dried by means of a heated roller, and also warmed until the resin coating binding the metallic powder is temporarily softened.

The invention will now be more particularly described with reference to the accompanying drawings, in which—

Figure 1 is a diagram of a machine employed for carrying out this improved method, and Fig. 2 is a plan view of a portion of the same.

The paper band *a*, provided with an unfinished coating of metallic powder in the ordinary way, is conveyed, by means of several guide-rollers *b*, almost horizontally over a lower roller *c* and from this to an upper roller *d*, which is so arranged relative to the roller *c* that the part of the paper band located between the two forms an inclined plane. The arrangement is such that the metallic side of the paper band faces downward at the part which reaches the roller *c* in a horizontally-stretched condition, and in the inclined part of the paper band it faces upward. Somewhat above the roller *c* a water-feed nozzle *e* is provided, the slot of which extends over the entire width of the paper band, so that a band-shaped jet of water of uniform strength is discharged onto the surface of the paper. As the metallic powder applied to the paper is as little soluble in water as the layer of resin binding the powder, the water merely by its mechanical action washes away the loosely-adherent excess of metallic powder (not, indeed, completely, but to a considerable extent) without injuring in any way the layer of metallic powder already adherent to the paper which lies under the said loose layer or affecting its uniformity. The mechanical action of the jet of water is assisted by a brushing-roller *f*, with a covering arranged in strips being provided somewhat below the place where the water is discharged on the roller *c*, which brushing-roller *f* serves to remove, at the place where the water acts, the metallic powder loosely lying on the paper band, which is then immediately washed away by the water without being able to set fast or stick in the covering of the brush-roller. By this means the drawback which has arisen where brushing devices are used alone is avoided—namely, that the brushes after some period of use, when they have become set full with the metallic powder, again apply the powder taken up to the paper band, and thus a permanently good action of the apparatus is insured. The washing-water accumulates in a vessel *g*, arranged under the roller *c*, and is from here removed in any suitable manner. At the upper roller *d* a second brushing-roller *h* is provided. This has for its object to remove the major part of any water carried up with the paper band. The paper band freed in this manner from water, or at least from the major part of the water, passes from the roller *d* over a hollow internally-heated roller *i* of large diameter and is carried round this over a considerably large periphery. In consequence of the roller being heated the moisture still contained in the paper band is entirely evaporated and the paper band is also

considerably heated, (preferably to about 140°.) By this means the particles of resin binding the metallic powder are softened without quite fusing and they combine with one another into a coherent coating which extends to a considerable depth into the band of paper or fabric, and consequently firmly adheres thereto. The finished paper or fabric band is conveyed, by means of a guide-roller *k*, to a winding-on device, (which is not shown in the drawings.)

I declare that what I claim is—

1. The method of producing a powder-coated fabric, which consists in applying to the fabric the desired powder, scrubbing the fabric to remove the loosely-adherent particles, removing the surplus water, heating, and allowing to cool.

2. The method of producing a powder-coated fabric, which consists in applying to the fabric the desired powder in a vehicle insoluble in water, scrubbing the fabric to remove the loosely-adherent particles of powder, removing the surplus water, heating, and allowing to cool.

3. The method of producing a powder-coated fabric, which consists in applying to the fabric a coating of metallic powder in a resinous vehicle, wet-scrubbing the fabric to remove the loosely-adherent particles, removing the surplus water, heating sufficiently to dry the fabric and soften the resin, and allowing to cool.

4. In a machine for carrying out the method described the combination of a water-feed nozzle a plurality of feed and brushing rollers, and a heating-roller in such mutual arrangement and succession that the band of paper or material in passing between a first guide-roller and its respective brushing-roller is freed by water falling from above between them from any excess of metallic powder, and on passing between a second guide-roller and a second brushing-roller belonging thereto, freed from the major part of the adherent water, and then by traveling over the heating-roller the drying and heating of the paper or material band is completed substantially as described.

5. In an apparatus for producing a powder-coated fabric, the combination, with rolls carrying the initially-coated fabric, of means for wet-scrubbing the coated surface of the fabric, means for removing the surplus water after scrubbing, and means for heating the fabric.

6. In an apparatus for producing a powder-coated fabric, the combination, with rolls carrying the initially-coated fabric, of a scrubbing-brush arranged closely adjacent to one of the carrying-rolls and bearing upon the coated surface of the fabric, means for supplying water to the fabric surface adjacent to the point of contact with the scrubbing-brush, means for removing the surplus water from the fabric after leaving the scrubbing-brush, and means for heating the fabric.

7. In an apparatus for producing a powder-coated fabric, the combination, with rolls carrying the initially-coated fabric, of a rotary scrubbing-brush arranged closely adjacent to one of the carrying-rolls and bearing upon the coated surface of the fabric, a water-jet for supplying water to the fabric surface adjacent to the point of contact with the scrubbing-brush, rotary means for removing the surplus water from the fabric after leaving the scrubbing-brush, and means for heating the fabric.

8. In an apparatus for producing a powder-coated fabric, the combination, with rolls carrying the initially-coated fabric, of a rotary scrubbing-brush arranged closely adjacent to one of the carrying-rolls and bearing upon the coated surface of the fabric, a water-jet having a width substantially equal to that of the fabric and supplying water to the coated surface of the fabric at the point of contact with the scrubbing-brush, a rotary brush for removing the surplus water from the fabric after leaving the scrubbing-brush, and a heated drum for heating the fabric.

9. In an apparatus for producing a powder-coated fabric, the combination, with rolls carrying the initially-coated fabric, of a rotary scrubbing-brush arranged closely adjacent to one of the carrying-rolls and bearing upon the coated surface of the fabric, a water-jet having a width substantially equal to that of the fabric for supplying water to the coated surface closely adjacent to the point of contact with the scrubbing-brush, a second rotary brush arranged closely adjacent to another of the carrying-rolls and bearing upon the wet surface of the fabric to remove the surplus water therefrom, and an internally-heated drum arranged to receive the fabric and heat the same.

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

FRITZ C. WICKEL.

Witnesses:
WILHELM HÜNN,
OSCAR BOCK.