(No Model.)

H. BORMANN.

APPARATUS FOR COATING OR SATURATING AND FINISHING ROOFING FABRICS.

No. 448,873. Patented Mar. 24, 1891.

Fig. 1.

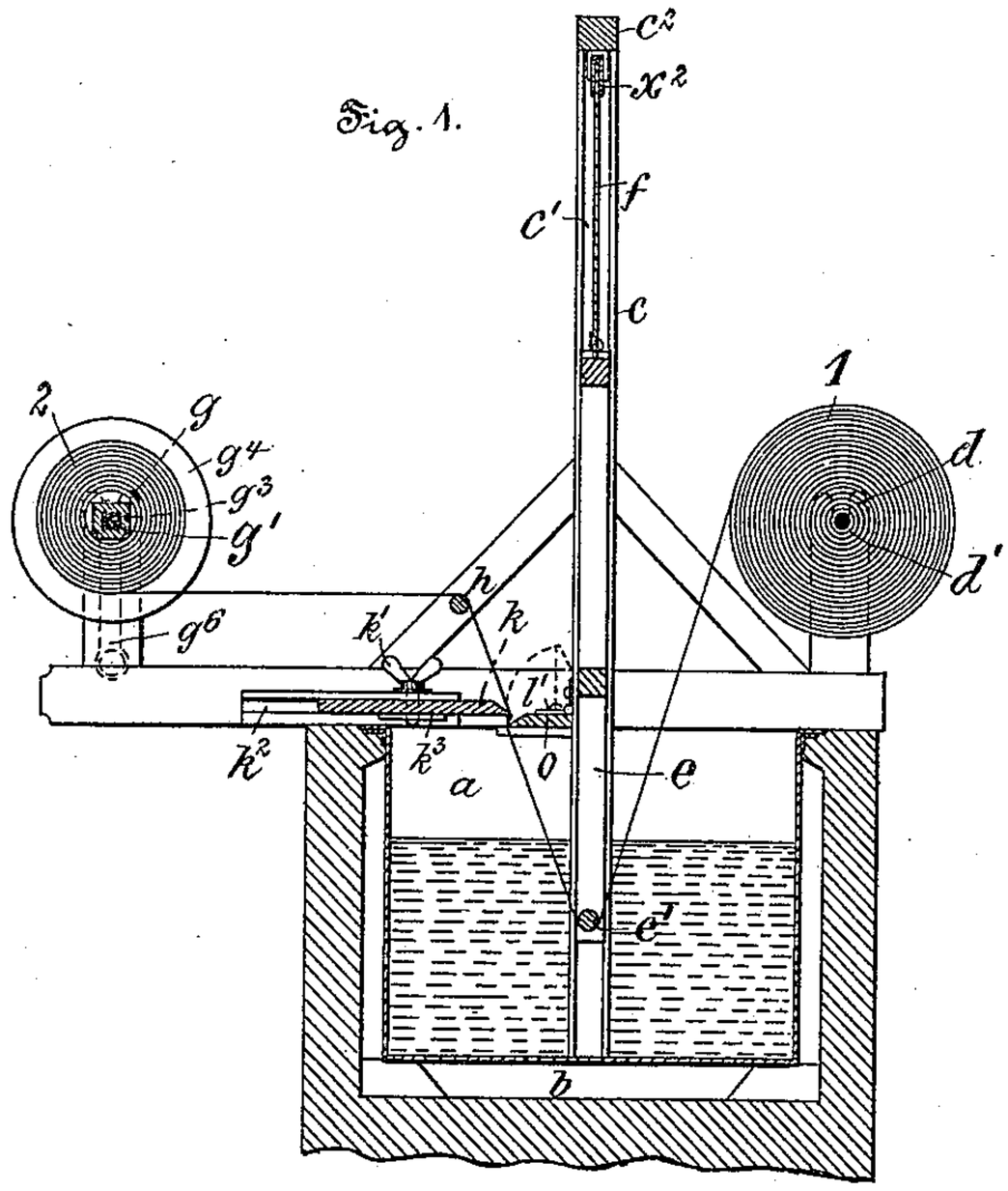


Fig. 2.

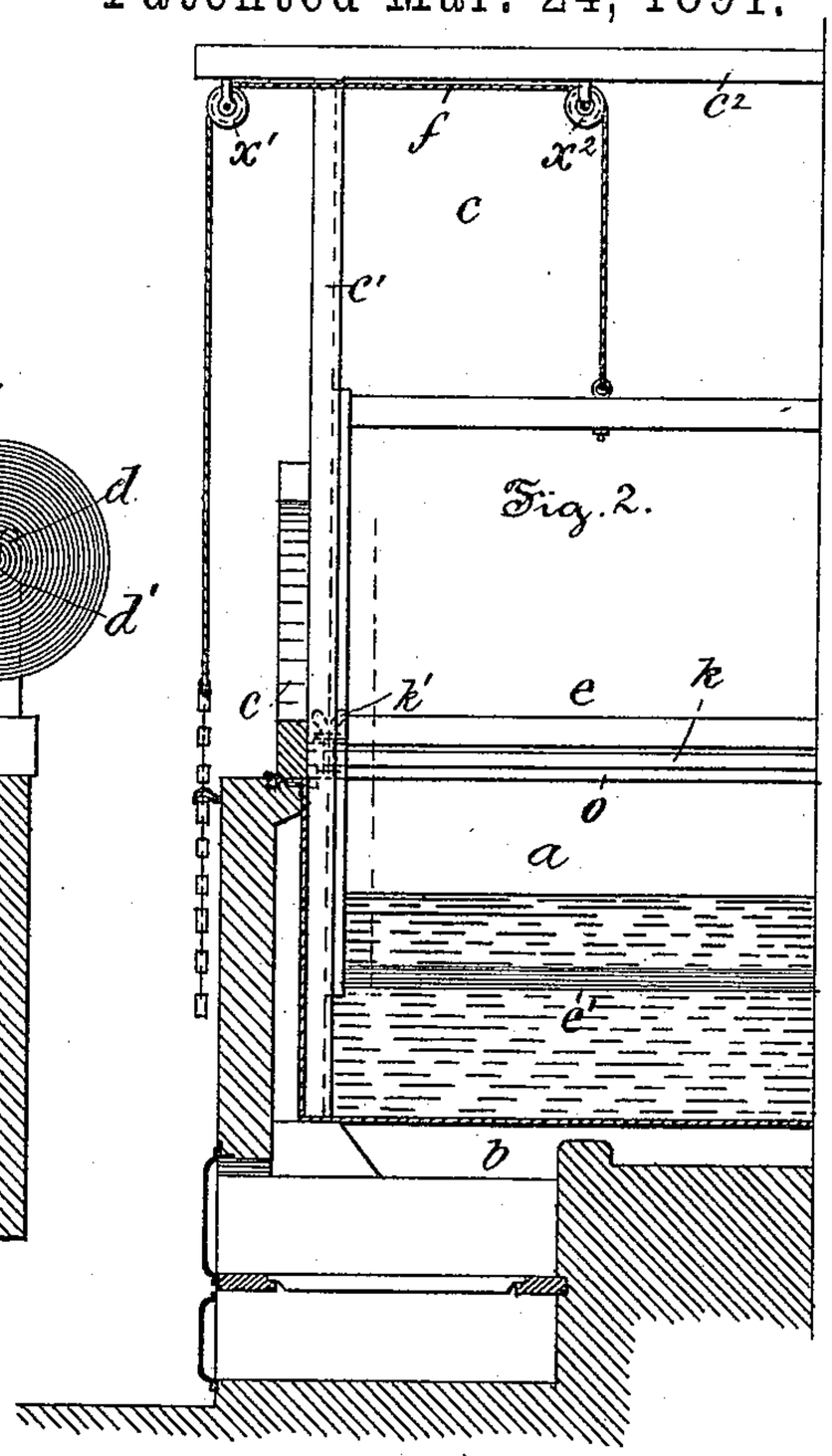
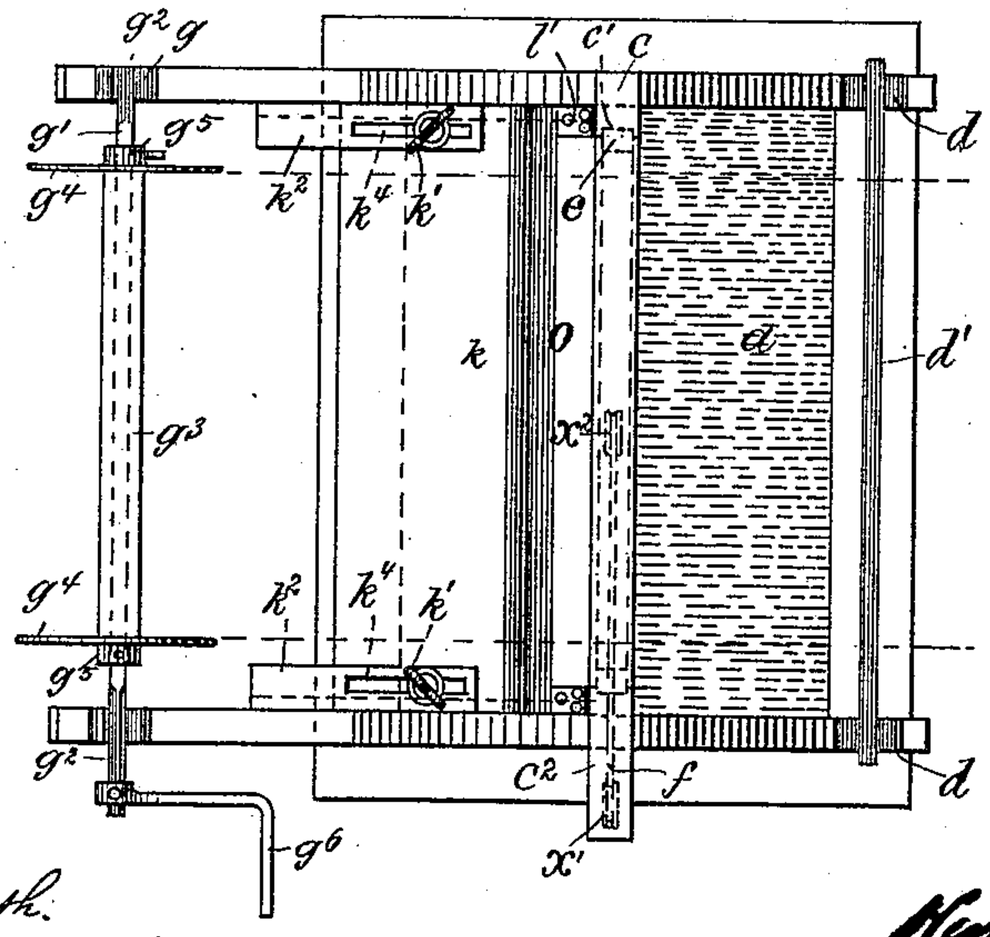


Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR COATING OR SATURATING AND FINISHING ROOFING FABRICS.

SPECIFICATION forming part of Letters Patent No. 448,873, dated March 24, 1891.

Application filed June 2, 1890. Serial No. 353,946. (No model.)

To all whom it may concern:

Be it known that I, HERMANN BORMANN, a subject of the Emperor of Germany, but now residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Coating or Saturating Roofing Fabrics, of which the following is a specification.

Heretofore it has been customary to saturate or coat paper with tar or analogous material by passing the same continuously through a tank containing such substance or material in a fluid state; but the paper in leaving the tank carried mechanically a superfluous quantity of the tar or tarry substance, so that large rooms were employed necessarily for permitting the paper to dry, when subsequently rigidly-supported scrapers were used for removing a portion of the superfluous tar or other tarry material from the respective sides of the paper. Although the employment of such rigidly-supported scrapers was an improvement on the previous method employed in the manufacture of roofing fabrics, still they did not remove the superfluous tar or other tarry material from the paper evenly and properly. For example, if the tar or other material employed was viscous, then the scrapers would not remove a sufficient quantity thereof, and, on the other hand, if the tar or other tarry material employed was very fluid, then the scrapers removed too much of the material. Consequently the paper was not evenly and properly coated or saturated. The degree of uniformity of the coated or saturated finished article depended upon the degree of fluidity of the tar or other material.

The principal objects of my present invention are, first, to obviate the above-mentioned disadvantages or objectionable features encountered and to provide simple, durable, and efficient apparatus for evenly and uniformly coating or saturating paper or other material with tar or other tarry substances, and, second, to effectually remove superfluous material from the paper or other somewhat similar materials.

My invention consists in providing an apparatus for coating or saturating paper or other material in the manufacture of fabrics for roofing and other purposes with two adjustable superposed knife-edge devices for removing superfluous material from one or both sides of the paper, as may be required.

My invention further consists in providing an apparatus to be employed in the manufacture of roofing fabrics having the parts thereof constructed, arranged, and adapted for operation in the manner hereinafter described, and pointed out in the claims.

The nature and particular characteristic features of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a view, partly in elevation and partly in section, of an apparatus for coating and saturating paper embodying the particular features of the invention, with two adjustable superposed knife-edge devices shown in application thereto. Fig. 2 is a transverse sectional view of a furnace for heating the tar or other tarry material with my invention applied thereto; and Fig. 3 is a top or plan view of Fig. 1, showing the means for permitting one of the knife-edge devices to be shifted or caused to assume a horizontal position and then clamped to place, and also showing the other knife-edge device hinged to a portion of the supporting-frame of the apparatus.

In the drawings, *a* is a tank or vat supported by the side or end walls of a furnace *b* and adapted to receive and contain tar or other preferred coating or saturating material.

c is a rectangular-shaped frame, also supported by the walls of the furnace *b*, and provided with vertical ways *c'*, having a horizontal transverse brace c^2 superposed thereon.

d are slotted bearing or journal boxes attached to the upper surface of the frame *c* and adapted to support a rod *d'*, passing through a roll of paper, felt, or other preferred material *i*.

e is a rectangular-shaped frame fitted to and adapted to be moved in the ways *c'* and provided with a guide-roll *e'*, hereinafter called an "immersing-roll," which is adapted to be immersed in the heated tar or other material contained in the tank *a*.

f is a cord or chain passing over pulleys x' and x^2, attached to the transverse brace c^2, and secured at one extremity thereof to the frame

c and made fast at the opposite extremity to the frame *c*, so that the immersing-roll *e'* may be lowered as far into the tank *a* as may be required.

g are slotted bearings or journal-boxes mounted on or attached to the upper side of the frame *c* and adapted for the reception of a square bar or rod *g'*, provided with rounded extremities g^2.

g^3 is a rectangular or box shaped device or distance-piece mounted on the rod *g'* and adapted to separate the end disks g^4 from each other, and g^5 are collars mounted on and secured to the rod *g'* for retaining said disks to place singly up against the box-shaped device *g'*. This device or distance-piece g^3 also permits of the ready removal from the machine of the roll of paper, felt, or other material after having been coated or saturated and laid up, in order that another similar device g^3 may be mounted on the shaft or bar *g'*, to be again mounted in the journal-boxes g^2, provided in the forward extremities of the frame of the machine.

g^6 is a hand-crank or other suitable device for revolving the bar or rod *g'*, in order to lay up the coated and saturated material in layers or sheets in a roll 2 thereon.

h is a guide-roll for directing the paper, felt, or other material from the tank *a*.

k is a knife-edge device adapted to slide in horizontal ways k^2, attached to the frame *c*.

k' are set-screws passing through slots k^4, formed in the guideways k^2, and engaging with nuts or threaded washers k^3, in order to permit of the adjustment of said knife-edge device *k* and to retain or clamp the same to place.

o is a knife-edge device located adjacent to and preferably beneath the knife-edge device *k*.

The knife-edge device *o* is attached to the frame *c* by means of hinges *l'*, in order to permit of its having a slight range of movement toward and away from the knife-edge device *k*, and, furthermore, in order to permit of its being caused to assume an inoperative position when required—for instance, as indicated by the dotted lines in Fig. 1.

The mode of operation of the above-described apparatus is as follows: Tar or other suitable material is melted in the tank or vat *a* by means of a fire built on the grate of the furnace *b* or in any other more convenient manner, and the paper, felt, or other material from the roll 1 passes under the immersing-roll *e'*, thence between the knife-edges *k* and *o*, and over the guide-roll *h*, whence it is laid up onto the roll 2 by means of the hand-crank or other suitable device g^6. After the paper, felt, or other material has been started well through the machine in the manner hereinabove described the immersing-roll *e'* is lowered by means of the cord or chain *f* into the tank *a*, so that the paper passing through the melted tar becomes coated or saturated therewith, and any superfluous material adhering to the paper, felt, or other material will be thoroughly removed therefrom by the knife-edge devices *k* and *o*. The knife-edge device *k* may be adjusted to remove the requisite amount of such material by means of the set-screws *k'*. Of course the position of the knife-edge device *k* with relation to the knife-edge device *o* will depend upon the degree of fluidity of the heated tar or other tarry substance contained in the tank *a*.

It may be remarked that the knife-edge device *o*, having a range of movement about the hinges *l'*, insures uniformity of finish in the roofing fabric or product.

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

1. The combination, with a machine for coating or saturating roofing fabrics, provided with a tank and means for drawing the fabric therethrough, of a knife-edge device adjustably attached to the machine and superposed upon the hinged knife-edge device, substantially as and for the purposes set forth.

2. The combination, with a machine for coating or saturating roofing fabrics, provided with a tank and means for drawing the fabric therethrough onto a laying-up roll, of a knife-edge device hinged to the machine and adapted to be upwardly turned, and a horizontal knife-edge device adjustably attached to the machine and superposed upon the hinged knife-edge device, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

HERMANN BORMANN.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.