No. 610,022. Patented Aug. 30, 1898.

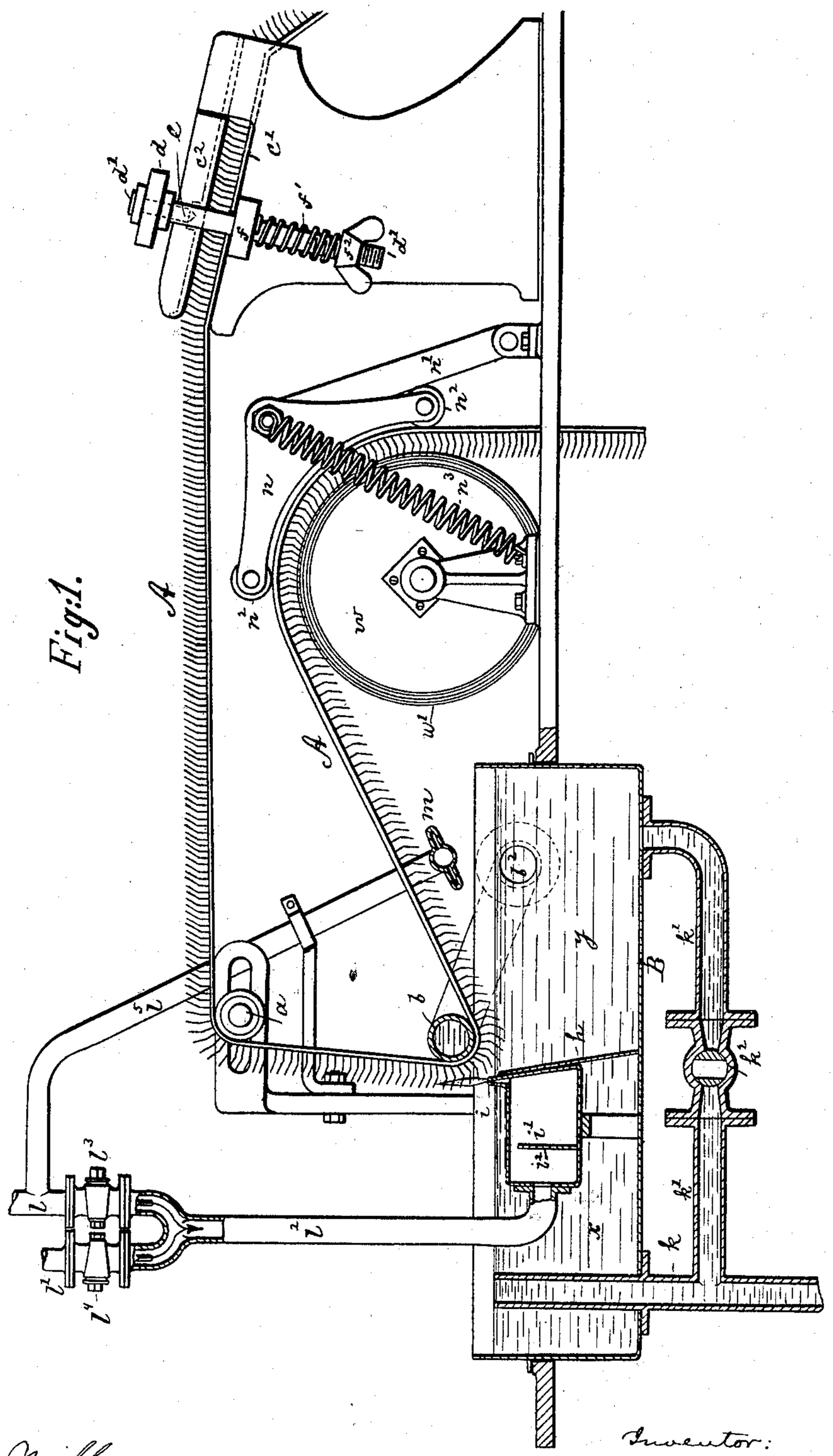
G. BOVENSIEPEN.

PROCESS OF AND APPARATUS FOR HARDENING POINTS OF CARDS.

(Application filed Oct. 11, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:
William Miller.
William Schulz.

Inventor:
Gustav Bovensiepen
by his attorneys
Roeder & Briesen

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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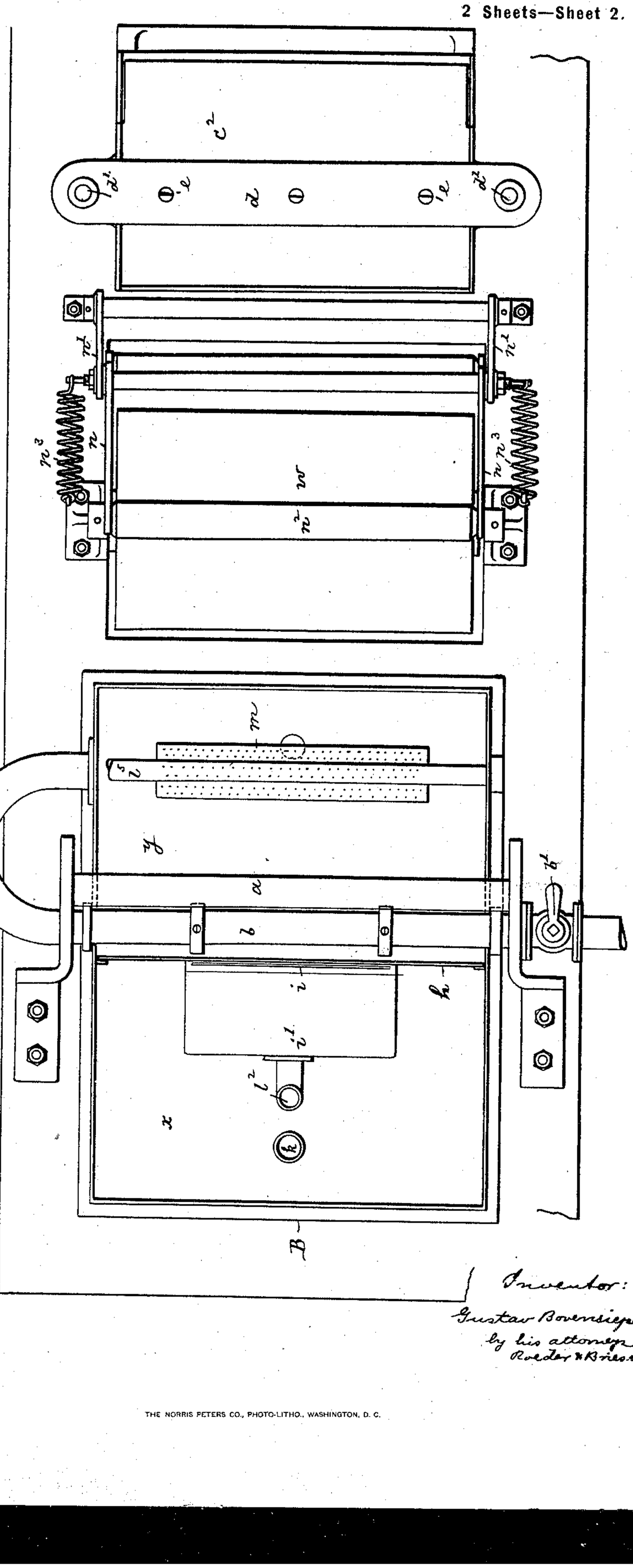
Fig: 2.



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UNITED STATES PATENT OFFICE.

GUSTAV BOVENSIEPEN, OF METTMANN, GERMANY.

PROCESS OF AND APPARATUS FOR HARDENING POINTS OF CARDS.

SPECIFICATION forming part of Letters Patent No. 610,022, dated August 30, 1898.

Application filed October 11, 1897. Serial No. 654,754. (No model.) Patented in Belgium January 12, 1897, No. 125,685; in France January 12, 1897, No. 263,027; in Austria January 16, 1897, No. 47/2,702; in Italy January 19, 1897, No. 43,663; in England January 20, 1897, No. 1,579, and in Switzerland January 25, 1897, No. 13,694.

To all whom it may concern:

Be it known that I, GUSTAV BOVENSIEPEN, a subject of the German Emperor, residing at Mettmann, Rhenish Prussia, Germany, have invented new and useful Improvements in Processes of and Apparatus for Hardening the Points of Cards, (for which I have obtained the following patents: in Belgium, No. 125,685, dated January 12, 1897; in France, No. 263,027, dated January 12, 1897; in Austria, No. 47/2,702, dated January 16, 1897; in England, No. 1,579, dated January 20, 1897; in Italy, No. 43,663, dated January 19, 1897, and in Switzerland, No. 13,694, dated January 25, 1897,) of which the following is a specification.

This invention relates to improved means for hardening the points of carding-teeth by first glowing, then cooling, and finally drying the teeth, while the body of the band is cooled during the time the teeth are glowed. In this way a card-band of superior quality is obtained.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of an apparatus embodying my invention. Fig. 2 is a plan of the same with the card-band removed.

The card-band A is first engaged by a brake mechanism c' c^2 to receive the proper tension. It then passes over an upper adjustable guide-roll a and over a lower hollow cooling tube or body b, located directly over cooling-tank B, and is finally engaged by a feed-roller w, driven in suitable manner. The brake mechanism consists of a lower table c' and of an upper movable shoe c^2, through each end of which passes a screw-shank d'. This screw-shank carries at its lower end a winged nut f^2 and is surrounded by a spring f', bearing against a fixed abutment f. The upper ends of the screw-shanks d' carry a cross-rail d, provided with pins e, that engage conical openings in the upper side of shoe c^2. By manipulating the nuts f^2 the pressure exerted by the shoe upon the carding-band may thus be readily adjusted.

The cooling-tank B is divided into two compartments x y by a partition h. The forward compartment y contains the cooling or hardening bath, of water or other liquid. This liquid is admitted at cock b', Fig. 2, flows first through the tube b to cool the same, and is thence discharged into compartment y through branch b^2. From the compartment y the bath overflows partition h to fill the rear compartment x and cool the reservoir i' of a Bunsen burner i therein contained.

A stand-pipe k is arranged with its mouth above the level of reservoir i', so that the latter is always submerged. At its lower end the compartment y communicates by drain k', having cock k^2, with the discharge-pipe k. If the compartment y is to be drained, the cock k^2 is opened, so that the water from compartment y will enter and flow out of the lower end of pipe k.

The guide-roll a is horizontally adjustable within its bearings, so that the angle at which the card is fed to the cooling-tube and the length of the way which the carding-teeth describe through the flame may be increased or diminished at pleasure.

The reservoir i' is supplied with a mixture of compressed air and gas through pipe l^2, so that ample oxygen to insure perfect combustion is provided. The compressed air is supplied to pipe l^2 by branch l, having cock l^3, while the gas is supplied by branch l', having cock l^4. A baffle-plate i^2 is arranged within reservoir i' between the burner i and the supply-pipe l^2 in order to shield the burner from the direct action of the current of compressed fuel.

In order to dry the card-teeth after having passed out of the hardening-bath, I arrange a tube m a short distance in front of tube b and below the lower side of band A. The tube m is perforated on its upper side and is supplied with compressed air from branch l by means of connection l^5. The compressed air is thus ejected against the card-teeth, which are still somewhat warm, and will dry the same rapidly.

The card-band A is held against the feed-roller w by means of friction-rolls n^2, journaled in arms n. These arms are pivoted to levers n' and are drawn toward the feed-roller w by means of springs n^3, so that a perfect engagement between the feed-roller and the card-band is effected.

The operation is as follows: From the brake c' c^2 the card-band travels over roller a, thence downwardly over tube b, and thence forwardly to the feed-roller w. Immediately back of tube b the points of the teeth on the descending band are glowed for a longer or shorter length, according to the adjustment of the guide-roll a. Simultaneously with the heating of the points the carding-cloth and those parts of the teeth which are held thereby are cooled by the cooling-surface of tube b without being moistened. After the points of the cards have cleared the burner they immediately enter the bath y to be hardened, and then they are dried by the air-jets ejected from tube m.

The feed-roller w may be provided with a covering w' of rubber or other elastic material, which protects the card-band against slipping.

What I claim is—

1. The process of hardening card-teeth secured in a card-band, which consists in glowing the teeth, simultaneously cooling the band, immersing the points of the teeth into a hardening-bath, and then drying the teeth by air-jets, substantially as specified.

2. An apparatus for hardening card-teeth secured in a card-band, which consists of a hollow cooling-body that engages the card-band, means for supplying a cooling medium to the interior of said body, a burner placed in proximity to such body, a vessel adapted to contain a hardening-bath, into which the points of the card-teeth enter after having passed the burner, and means for feeding the card-band, substantially as specified.

3. An apparatus for hardening card-teeth secured in a card-band, which consists of an upper adjustable guide-roll, a lower hollow cooling-body, means for supplying a cooling medium to the interior of said body, a burner placed in proximity to such body, a vessel adapted to contain a hardening-bath into which the points of the card-teeth enter after having passed the burner, and means for feeding the card-band, substantially as specified.

4. An apparatus for hardening card-teeth secured in a card-band, which consists of a brake mechanism, a guide-roll in the rear thereof, a cooling-body beneath the guide-roll, a burner placed in proximity to the cooling-body, a vessel adapted to contain a cooling-bath placed underneath the same, and means for feeding the card-band, substantially as specified.

5. An apparatus for hardening card-teeth secured in a card-band, which consists of a hollow cooling-body that engages the card-band, means for supplying a cooling medium to the interior of said body, a burner placed in proximity to the cooling-body, a vessel adapted to contain a bath placed underneath the same, a perforated tube adapted to throw drying-jets upon the teeth after their emergence from the bath, and means for feeding the card-band, substantially as specified.

6. In an apparatus for hardening card-teeth secured in a card-band, a hollow cooling-body, means for supplying a cooling medium to the interior of the same, a Bunsen burner placed in proximity to said body, means for supplying gas and air to said burner, a vessel adapted to contain a hardening-bath placed underneath the cooling-body, and means for feeding the card-band, substantially as specified.

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

GUSTAV BOVENSIEPEN.

Witnesses:
R. E. JAHN,
OTTO KÖNIG.