

H. J. SMITH.

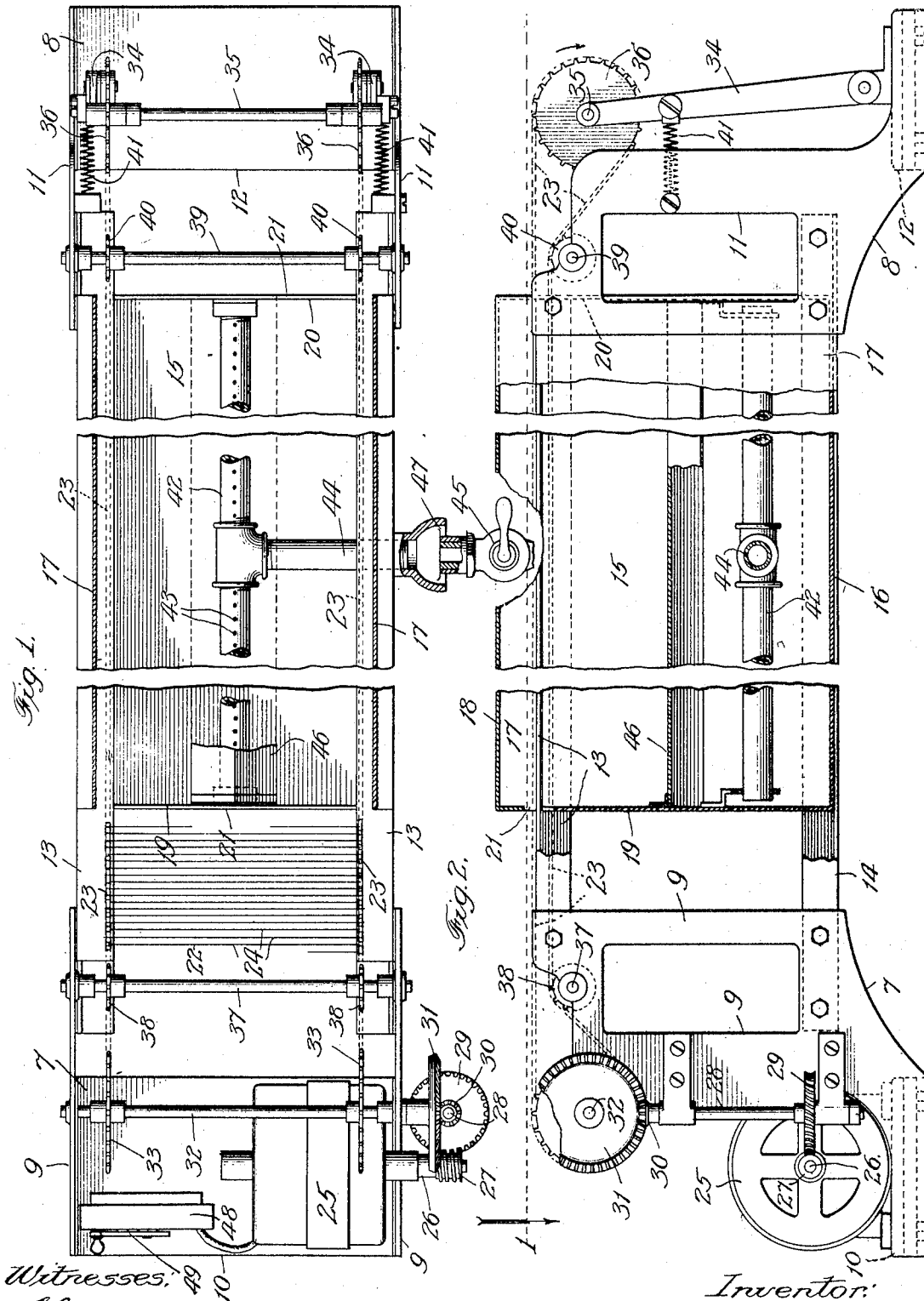
APPARATUS FOR MELTING AND DRYING EMBOSSED PRINTING.

APPLICATION FILED SEPT. 11, 1911.

Patented May 7, 1912.

2 SHEETS—SHEET 1.

1,025,594.



Witnesses,
Chas. H. Bull,
G. F. Chase

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2 SHEETS—SHEET 2.

Fig. 4.

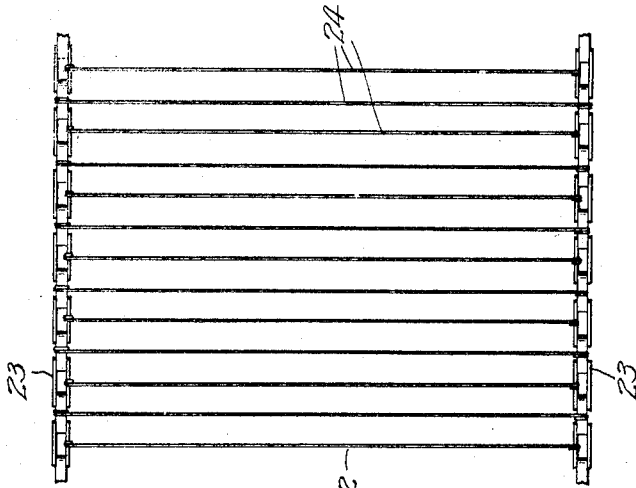


Fig. 5.

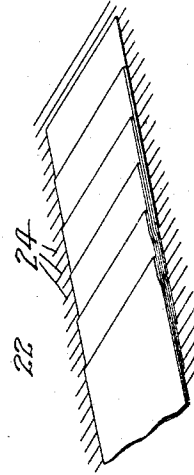
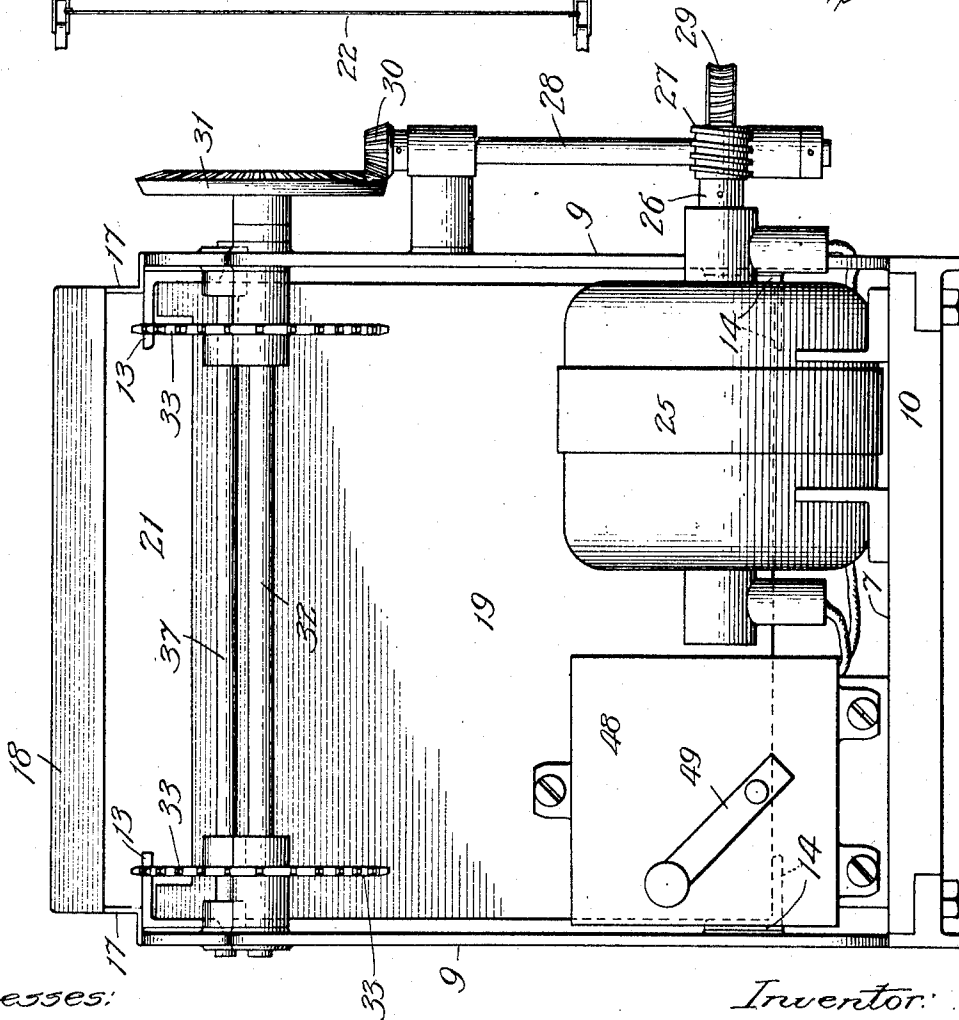


Fig. 3.



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UNITED STATES PATENT OFFICE.

HAZOR J. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR TO EMBOSSED PROCESS COMPANY,
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APPARATUS FOR MELTING AND DRYING EMBOSSED PRINTING.

1,025,594.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed September 11, 1911. Serial No. 648,715.

To all whom it may concern:

Be it known that I, HAZOR J. SMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Apparatus for Melting and Drying Embossed Printing, of which the following is a specification.

My object is to provide a heating apparatus of simple and improved construction adapting it for use in carrying out one of the steps of a certain method for producing embossed printing on sheets of paper.

In practising the method referred to an impression, of the character or matter which is to appear in embossed form, is made upon the paper-sheet with a tacky printing-substance, which is then covered with a powdered resinous embossing-compound. All the compound which does not adhere to the tacky impression is removed and the surface of the paper to which the substances are applied is finally subjected to heat at a temperature which melts the embossing compound employed and dries the impression. The improved apparatus forming the subject of the present application has been especially devised to enable the said final step to be practised in a convenient and economical way, to produce the best results.

Referring to the drawings which illustrate my apparatus—Figure 1 is a broken plan section taken on line 1 in Fig. 2; Fig. 2, a broken and partly sectional side-elevation; Fig. 3, an enlarged end elevation with the carrier removed; Fig. 4, a broken plan view of an endless traveling sheet-carrier; and Fig. 5, a broken perspective view illustrating the way the sheets, such as printed letter-heads, are positioned on the carrier for movement through the apparatus.

The reference numerals 7 and 8 designate the opposite end-frames of the apparatus; the frame 7 is formed of sides or cheeks 9 connected together by a platform 10; and the end-frame 8 is formed with sides or cheeks 11 connected together by a platform 12. The two end-frames are connected in rigid relation by means of a pair of upper horizontal angle-bars 13 and a pair of lower horizontal angle-bars 14. Secured to and supported by the angle-bars 13, 14 is a sheet-metal chamber or oven 15 having a bottom-wall 16, side-walls 17, top 18 and end-walls 19, 20. The upper faces of the angle-bars

13 present longitudinally-extending shelves and at the said shelves the ends 19, 20 are provided with transversely-extending slots or openings 21.

Extending longitudinally across the upper part of the chamber or oven 15 is an endless carrier 22 consisting of parallel side-chains or link-belts 23 connected together at each of their links by a parallel series of wire rods 24 forming an endless flexible platform. Mounted on the platform 10 is an electric motor 25 having an armature-shaft 26 provided with a worm 27. A vertical shaft 28 journaled on the adjacent cheek 9 carries a gear 29, driven by the worm 27, and a beveled pinion 30 driving a gear 31 carried by a horizontal shaft 32 journaled at its opposite end-portions in the cheeks 9. The shaft 32 carries sprocket-wheels 33. Mounted on the platform 12 is a pivotal frame 34 in the upper end of which is journaled a shaft 35 carrying sprocket-wheels 36. The chains 23 of the endless carrier extend around the sprocket-wheels 33, 36, the chains at their upper stretches moving upon the shelves formed by the angle-bars 13. Journaled in the cheeks 9, between the shaft 32 and oven, is a shaft 37 carrying two idle sprocket-pinions 38; and journaled in the cheeks 11 between the shaft 35 and oven is a shaft 39 carrying idle sprocket-pinions 40. The sprocket-pinions 38, 40 form guides for the lower stretches of the chains in a plane slightly below the shelves 13. Bearing against the frame 34 at opposite sides are belt-tensioning springs 41. The motor drives the shaft 32, through the intermediate gears, causing the sprockets 33 to drive the carrier, in the direction of the arrow in Fig. 2, at comparatively slow speed. The upper and lower stretches of the carrier pass through the slots 21 in the end-walls 19, 20.

In the lower part of the chamber or oven 15 is a horizontal, longitudinally-extending burner-tube 42 provided in its upper side with a row of burner-perforations 43. The gas is supplied to the burner-tube 42 through a pipe 44 which is equipped with a regulating valve 45. Extending longitudinally over the burner-tube 42 is a baffle-plate 46.

When the gas is turned on and lighted at the burner openings or perforations 43 the hot products of combustion fill and heat the

oven, escaping through the slots 21. The gas entering from the valve 45 to the pipe 44 is mixed with air entering at 47 to form the necessary highly-inflammable burning-mixture, so that combustion is complete and the products of combustion filling the oven carry no free carbon. As the carrier advances the sheets containing the embossments to be melted and dried are arranged upon the carrier, as indicated, for example, in Fig. 5, the platform presented by the carrier between the sprocket-wheels 33 and oven being sufficiently extensive for all purposes. The sheets are moved by the carrier through the slots 21 in the wall 19, thence longitudinally through the oven and out through the slots 21 in the wall 20 and are discharged from the carrier beyond the sprockets 36.

The embossing compound which, as before stated, is sprinkled upon, or otherwise applied to, the tacky printing substance with which the original impression is made, is of a resinous character and melts at a temperature below that which will cause charring or undue drying or discoloring of the paper sheets.

In practice, the present apparatus is located at a convenient distance beyond the delivery end of the printing press, which produces the original tacky impressions, and the operator stands in a position between the press and apparatus. As a sheet is delivered by the press it is taken by the operator, the printed surface is sprinkled by him with the embossing compound, and the surplus thereof, which does not adhere to the tacky impression, blown or dusted off, after which the sheet is laid upon the receiving end of the traveling carrier, as indicated in Fig. 5. An operator becomes with practice quick and skillful, and the carrier should travel at a speed which will not delay the operator while properly placing the sheets thereon. The length of the oven, which governs the distance of travel of the sheet through the heated atmosphere, should be sufficient to enable thorough melting of the embossing compound and drying of the impression to take place before the sheets are discharged from the apparatus and stacked. The speed of travel of the carrier depends upon the speed of the motor 25 and the latter may readily be controlled through a speed-regulating rheostat 48 interposed in the motor circuit and equipped with a switch lever 49, all in a common manner.

The heat of the oven is controlled through the valve 45, and the hot products of combustion by playing against the underside of

the baffle-plate 46 and moving thence upward around the latter are well distributed to insure an equal temperature throughout the length of the oven. While the embossing compound will melt at a temperature below that which would char the paper, it is necessary that the temperature of the oven should be regulated with some care with reference to the time that the sheets are subjected thereto. If the temperature is too great the embossing compound may be melted unduly and tend to spread beyond the confines of the impression and detract from the sharp outlined effect necessary for the production of high-class embossed printing. Furthermore, while the temperature in the oven is below that which would effect charring of the paper, if the latter is subjected to the temperature for a time too much prolonged, the sheets may be discolored or unduly dried, or dehydrated, which tends to make them brittle, and therefore undesirable. The regulating means with which I provide the apparatus enables the operator to readily govern the temperature of the oven and the speed of the carrier, so that with ordinary care the best results in the melting and drying of the embossment may be obtained without appreciable injury to the paper sheets.

It is found that the apparatus herein shown and described operates perfectly for the particular purpose for which I have devised it, and the perfection of its operation is attributable to the particular construction and combination of parts set forth in the appended claim.

What I claim as new and desire to secure by Letters Patent is—

In a heating apparatus for the purpose set forth, the combination of an elongated oven having end-walls provided with horizontal slots in their upper portions, an endless traveling sheet-carrier movable through said slots across the upper part of the oven and comprising a pair of parallel endless chains with wire rods at close intervals connecting them, means for driving the carrier, a heater, housed in the lower part of the oven wholly below the carrier, means for regulating the oven temperature and means for regulating the speed of the carrier, all constructed and arranged to operate substantially as described.

HAZOR J. SMITH.

In presence of—

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R. A. SCHAEFER.