

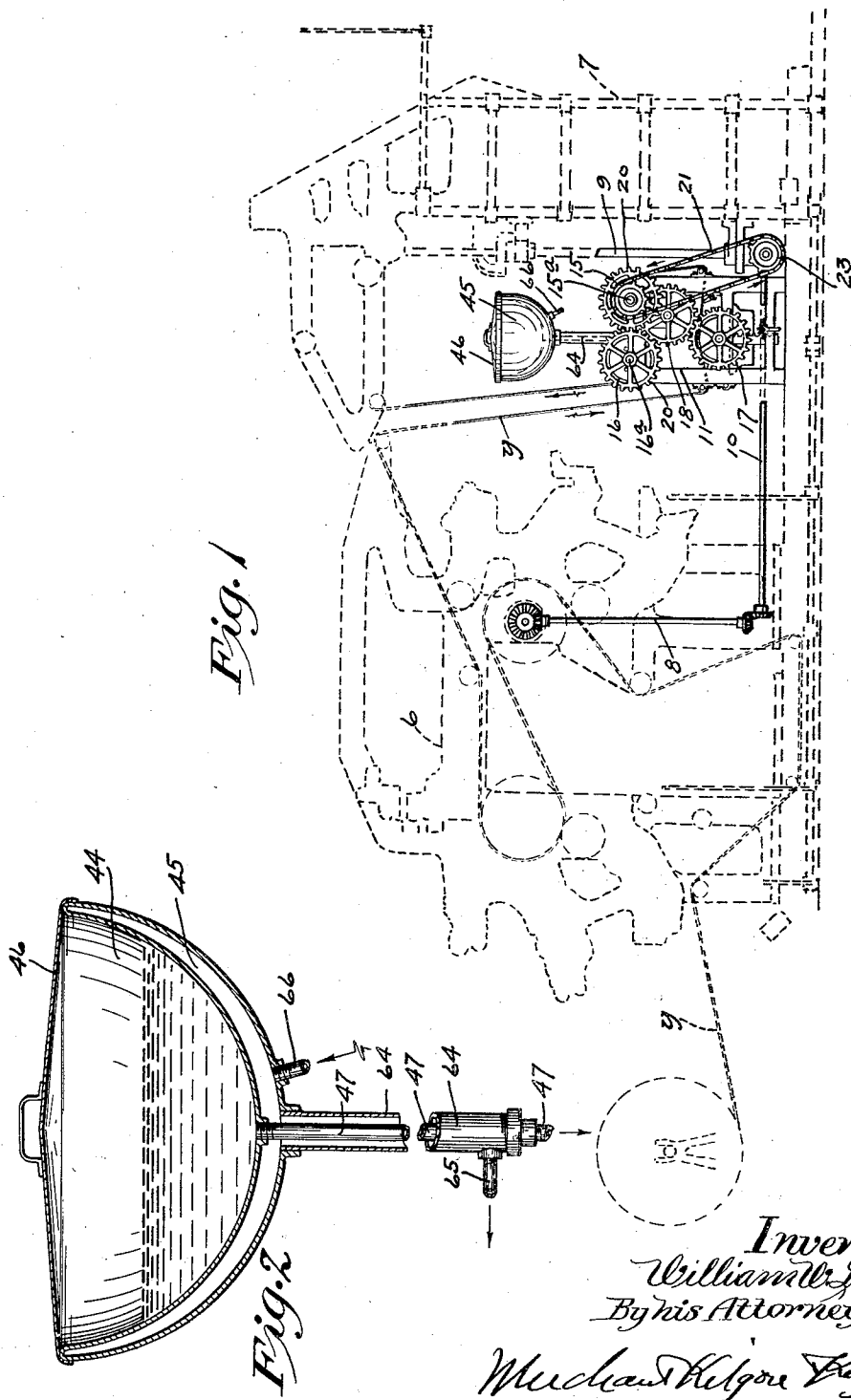
Dec. 11, 1923.

1,476,988

W. W. LATTA
CARBONIZING MACHINE

Filed July 2, 1921

3 Sheets-Sheet 1



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William W. Latta
By his Attorneys

Muchand Helgore Helgore

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3 Sheets-Sheet 2

Fig. 4

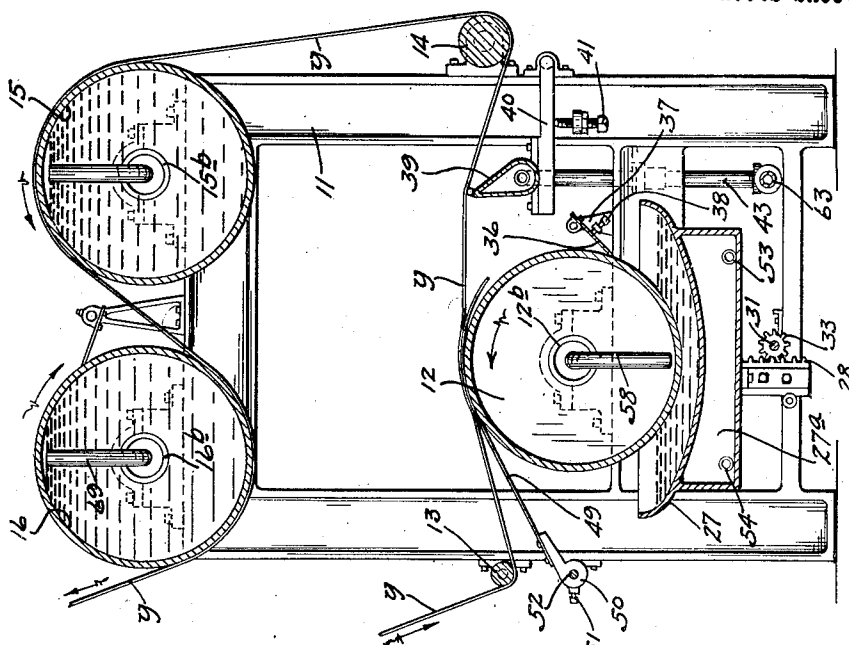
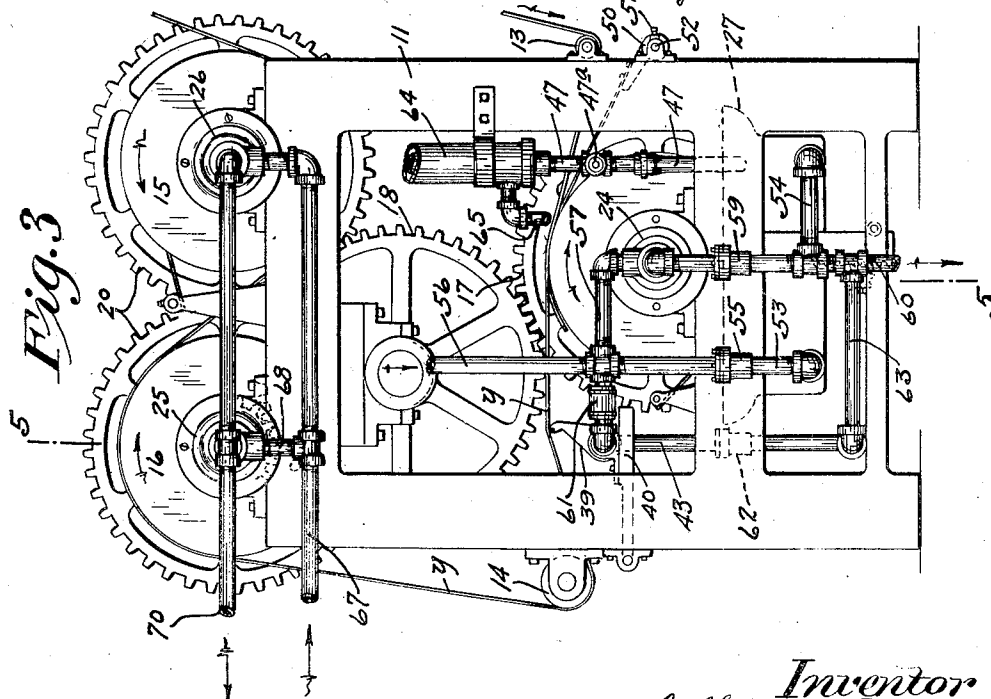


Fig. 3



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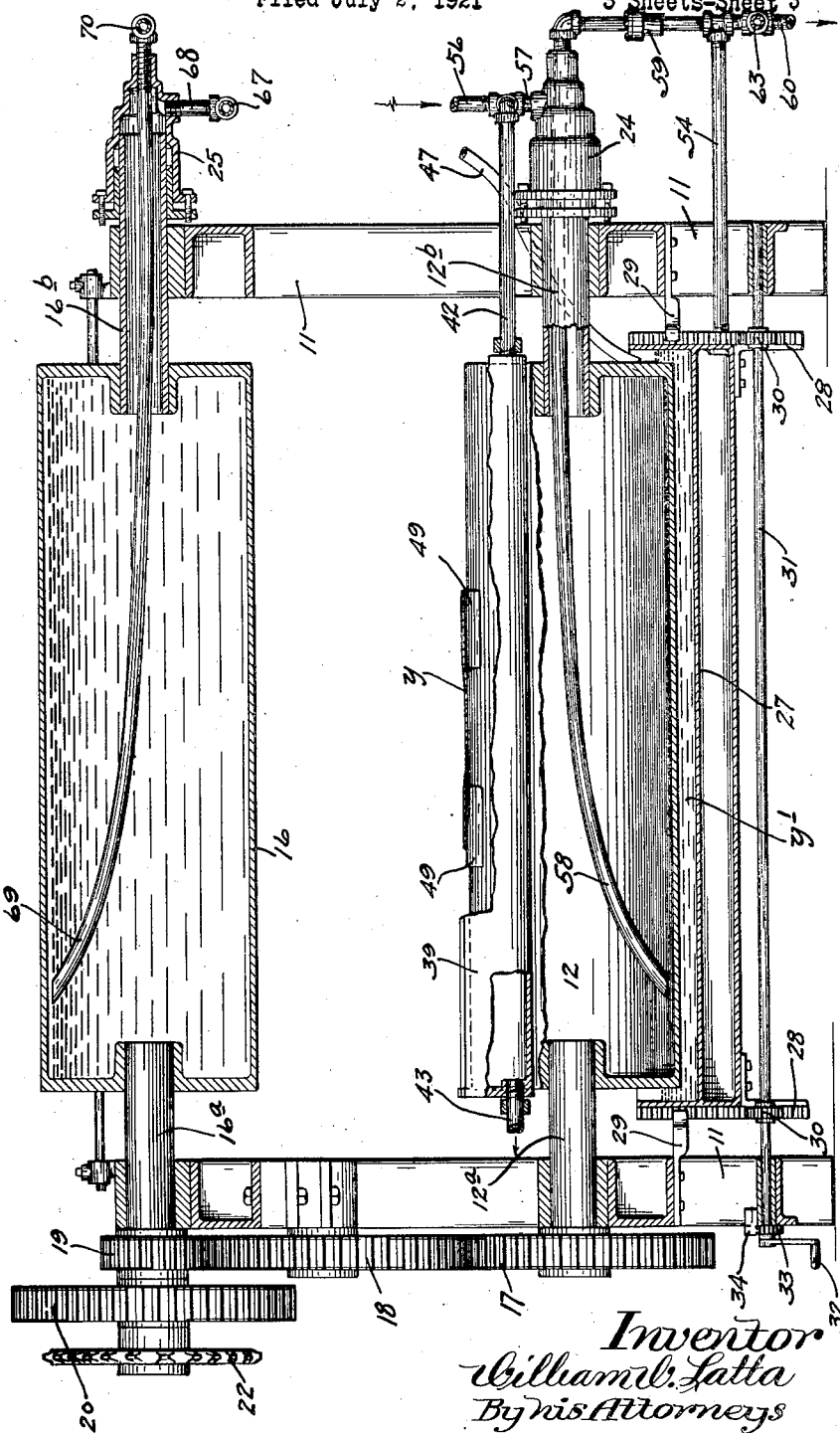
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3 Sheets-Sheet 3

Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM W. LATTA, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-THIRD TO EDWARD BARCHARDT, ONE-THIRD TO PHILIP W. WIRTH, AND ONE-THIRD TO LATTA & MANDERS CO., ALL OF MINNEAPOLIS, MINNESOTA.

CARBONIZING MACHINE.

Application filed July 2, 1921. Serial No. 482,092.

To all whom it may concern:

Be it known that I, WILLIAM W. LATTA, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Carbonizing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the art of applying coatings or solid surfaces of carbon, graphite, paraffin and the like to paper sheets. Hitherto, this has been done in various different ways by the use of machines or apparatuses designed solely for such purpose and operating independently of other machines, such as printing presses and folding or cutting machines.

One of the most important uses of this machine or apparatus is to apply carbon surfaces to the leaves of so-called "sales books." These leaves, as generally made and used, have printed zones or portions and intervening carbon surfaces and also certain blank surfaces, which are arranged to receive certain written memorandum both directly from a pencil and from the carbon.

Hitherto, it has been the practice to first run the paper sheet or web through a special coating machine that would lay the coating of carbon, graphite, paraffin or similar or other coating material on the surface of the paper; and then the paper was re-wound into convenient rolls, which were later taken to the rotary printing press where the printed matter was applied to the paper.

In accordance with my invention, I interpose the coating machine, that is, the machine for applying the carbon or the like, between a printing press and an automatic folding or cutting machine and operatively connect the same to run in synchronism both with the press and folding or cutting machine, so that said three machines operate continuously and perform their several functions in the proper sequence and order of time.

The coating machine, in itself, involves novel features but, largely, its novelty resides in its co-ordination with the press and folding or cutting machine, so that the

press, the coating machine and the folding or cutting machine operate as a single complete machine.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a right side elevation partly in diagram and partly in full lines showing the coating machine and its manner of association with and co-operative connection to the printing press and folding and cutting machine;

Fig. 2 is a fragmentary vertical section of the melting pot and its steam connections;

Fig. 3 is a left side elevation of the coating machine, showing the same on a larger scale than in Fig. 1;

Fig. 4 is a vertical longitudinal section taken through the machine illustrated in Fig. 3 in a plane approximately at the transverse center thereof and viewing said parts from the right toward the left or in the same direction as in Fig. 1; and

Fig. 5 is a transverse vertical section taken approximately on the irregular line 5-5 of Fig. 3, some parts being shown in full.

The printing press shown in Fig. 1 may be of the type well known to the trade as a "Meizel" press. This press is indicated as an entirety by the numeral 6. Also, the folding and cutting machine shown in Fig. 1 may be assumed to be of the type well known as the "Meizel" folder or cutting machines, which are used in connection with said press. This folder or cutting machine is indicated as an entirety by the numeral 7. The press 6 has an upright power-transmitting shaft 8 that is connected to an upright power-transmitting shaft 9 of the folding and cutting machine 7, through a horizontal shaft 10 that is suitably geared thereto so that the press and folding or cutting machine run in synchronism and with a properly timed action.

The sheet or web of paper *y* is run through the press and folder or cutting machine in the customary and well known manner and over suitable guides and rollers not necessary for the purposes of this case to consider.

I will now describe the coating machine in its preferred form and one way in which it may be coupled to be driven from and run

in synchronism with the press and folding or cutting machine. The framework of this coating machine may be of any suitable construction but, as shown, is a cast skeleton rectangular structure 11 located between the

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Journaled on the frame 11 is a so-called coating roller or drum 12, guide rollers 13 and 14 and cooling rollers or drums 15 and 16. The rollers or drums 12, 15 and 16 are hollow but, at one end or at one side of the frame 11, are provided, respectively, with trunnions 12^a, 15^a and 16^a. The trunnion 12^a carries a spur gear 17 that meshes with an intermediate gear 18 journaled on the frame 11, and the gear 18 meshes with a spur pinion 19 on the trunnion 16^a. The trunnions 15^a and 16^a carry intermeshing gears 20, that cause the rollers 15 and 16 to rotate in opposite directions.

Power for running the coating machine, as illustrated, is transmitted through a sprocket chain 21 that runs over a sprocket 22 on the trunnion 15^a and over a sprocket 23 that is

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At the opposite side of the machine, the rollers 12, 15 and 16, respectively, are provided with hollow trunnions 12^b, 15^b and 16^b that are journaled in suitable bearings on the frame 11. The outer ends of the hollow trunnions 12^b and 15^b are arranged to rotate, respectively, within non-rotary gland-equipped coupling heads 24, 25 and 26.

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The coating roller 12 is arranged to run partly immersed in the hot coating liquid γ^1 contained in a pan or receptacle 27. This pan is mounted for vertical movements preferably as follows: To the ends thereof are secured vertical racks 28, guided for vertical movements by brackets 29 on the sides of the frame 11. The racks 28 mesh with pinions 30 on a transverse shaft 31 journaled in bearings on the frame 11 and provided at one end with an operating crank 32 and with a ratchet wheel 33, which latter is adapted to be locked by a dog 34 pivotally supported at one side of the frame 11. The purpose of vertically adjusting the pan 27 is to properly regulate the depth to which the roller 12 will run in the coating liquid γ^1 .

By reference particularly to Fig. 4, it will be seen that the paper sheet or web γ runs under the guide rollers 13 and 14 and directly over the upper surface of the coating roller 12, by which latter, the coating material is applied to the under surface of said sheet or web. It is also important to note that the uncoated side of the sheet or web γ runs over the roller 15 and, later, that the coated side thereof runs in contact with the under surfaces of the roller 16.

For carbonizing the paper sheet or web, a mixture of pulverized carbon and paraffin wax may be used. This mixture, as well as other material which may be used, will be in

liquid form only when quite hot and will solidify as soon as cool. Hence, the roller 12 must be kept hot and the cooling rollers 15 and 16 must be kept cold.

The coating roller 12 rotates in the direction of the arrow marked thereon in Fig. 4, and to scrape off surplus carbon or coating solution, a small scraper blade 36 is pivotally connected to lugs 37 on the sides of the frame 11 and is made adjustable by a screw 38.

To scrape off surplus carbon from the under surface of the sheet or web γ and to even up the application thereof, I provide a scraper blade or device 39 that is mounted on arms 40 pivoted to the frame 11 and made vertically adjustable by screws 41. This scraper blade 39 is hollow and, at one end, is tapped by an inlet pipe 42 and at its other end, by a discharge pipe 43.

The coating material is primarily placed in a melting pot 44 that is formed with a hot water or steam jacket 45 and is supported in an elevated position. The melting pot 44 is shown as provided with a removable cover and its bottom is connected by a delivery pipe 47, to one end of the solution-containing pan 27.

On the continuously running paper sheet or web γ , it is frequently or, in fact, usually desirable, even on the carbonized side thereof, to leave clear or uncarbonized zones or strips on which certain matter may be printed or written; and this I accomplish by the use of thin sheet metal so-called "blanking" strips 49 shown as secured to heads 50 adjustably secured by set screws 51 on a transverse rod 52 supported by the sides of the frame 11. The free ends of the strips 49 are curved and are placed between the upper surface of the roller 12 and the overlying portion of the web γ , so that they prevent carbon from being applied to the web where said strips 49 are applied.

The pan 27, at its underside or bottom, is provided with a steam chamber 27^a that is tapped at one end by a steam supply pipe 53 and at the same end by a steam discharge pipe 54. The pipe 53, by a telescopic joint 55, is connected to a main steam supply pipe 56 that leads from a suitable source of steam supply. The steam supply pipe 56 is connected by a short pipe 57 to a coupling head 24 and from thence through the hollow trunnion 12^b to the interior of the roller 12.

From the lower portion of the interior of the roller 12, an outlet pipe 58 extends outward through the hollow trunnion 12^b and head 24 and is connected by a telescopic joint 59 to a main steam discharge pipe 60. The steam discharge pipe 54 is also connected to said pipe 60.

The steam supply pipe 42, that leads to the hollow scraper 39, is connected to the steam supply pipe 56 by a flexible joint 61, (see particularly Fig. 3). The steam dis-

charge pipe 43, by a telescopic joint 62, is connected to a stationary pipe 63, which, in turn, is connected to the main exhaust pipe 60.

The delivery pipe 47 is surrounded by a tubular supporting standard 64, the lower end of which is closed but which, at its lower portion, is tapped by a steam discharge pipe 65. A live steam supply pipe 66 leads to the chamber 45 of the melting pot 44.

To keep the rollers 15 and 16 cold, cold water is circulated therethrough, as shown, through the following connections: The numeral 67 indicates a cold water supply pipe that is connected by short pipe sections 68 to the two coupling heads 25 and 26 and thence to the interiors of the rollers 15 and 16 through the hollow trunnions 15^b and 16^b. The numeral 69 indicates cold water return pipes that lead from the upper interior portions of the rollers 15 and 16, out through the hollow trunnions 15^b and 16^b and heads 25 and 26 and are connected to a cold water discharge pipe 70.

The feed pipe 47 is provided with a valve 47^a for controlling the supply of hot coating substance from the melting pot 14 to the pan 27.

Operation.

Obviously, the coating material, which is assumed to be a mixture of paraffin wax and carbon, will be kept in liquid condition in the melting pot 44 by steam introduced into the chamber 45. By opening and closing the valve 47^a in the feed pipe 47, the desired amount of this coating liquid may be kept within the pan 27 and there kept hot by steam delivered into the chamber 27^a. By steam introduced into the coating roller 12, said roller is kept hot, so that it will pick up only approximately the desired amount of material for application to the paper web or sheet *y*. As afore stated, surplus material will be scraped off of said roller 12 by the blade 36.

The carbon coating applied to the under surface of the web *y* in passing over the hot scraper 39 will be ironed out and pressed evenly and then, as the web passes onward, this applied coating will rapidly cool and its cooling will be greatly accelerated as the uncoated side of the web passes against and over the first cold roller 15. The coated surface of the web then passes under and against the second cold roller 16, where it will be rendered cold and hard and will lose its adhesive property.

The paper web will, of course, have been printed on one or both sides, as desired, in its passage through the press 6. After the carbon coating has been applied as described, the web passes to the folding or cutting machine where it will be cut into

suitable sections or folded in the usual and well known manner.

The rollers 15 and 16 are geared to run at the same peripheral speed as the rollers or cylinders of the printing press, so that there will be no tendency to break the paper web *y*.

Thus, the printing, coating and cutting or folding is rapidly and accurately performed as a continuous operation and the cost of production of sheets of the general character above described is thereby reduced to a minimum.

It will be understood that the sheets may be printed on one or both sides and may be coated on one or both sides and, of course, may be printed in one or more colors. The machine, while capable of use for printing and coating paper sheets or webs for various different purposes, is, nevertheless, especially well adapted for use in producing the leaves of duplicate and triplicate sales books.

What I claim is:

1. A machine for coating paper webs or sheets comprising a pan for containing a coating material and means for keeping said pan hot, a coating roller arranged to run partly immersed in the hot liquid contained in said pan, means for guiding the paper web against the periphery of said coating roller, a cooling roller over which the paper web is arranged to run, and a blanking strip applied to said coating roller where it contacts with the paper web.

2. A machine for coating paper webs or sheets comprising a pan for containing a coating material and means for keeping said pan hot, a coating roller arranged to run partly immersed in the hot liquid contained in said pan, means for guiding the paper web against the periphery of said coating roller, a cooling roller over which the paper web is arranged to run, and a blanking strip applied to said coating roller where it contacts with the paper web, said blanking strip being adjustable transversely of the web axially of said roller.

3. A machine for coating paper webs or sheets comprising a pan for containing a coating material and means for keeping said pan hot, a coating roller arranged to run partly immersed in the hot liquid contained in said pan, means for guiding the paper web against the periphery of said coating roller, a cooling roller over which the paper web is arranged to run, and a plurality of thin metal blanking strips applied to said roller where it contacts with the paper web, said blanking strips being laterally adjustable the one toward and from the other.

4. A coating machine comprising a hollow coating roller having connections for the introduction of a heating medium thereinto, a pair of hollow cooling rollers hav-

ing means for introducing a cooling medium thereinto, guides for directing a paper strip first against the periphery of said coating roller, thence with its uncoated surface
5 against the periphery of the first cooling roller and thence with its coated surface against the periphery of the second cooling roller, and a blanking strip engageable with the periphery of said coating roller where it
10 contacts with the paper web.

5. A coating machine comprising a hollow coating roller having connections for the introduction of a heating medium thereinto, a pair of hollow cooling rollers having
15 means for introducing a cooling medium thereinto, guides for directing a paper strip first against the periphery of said coating roller, thence with its uncoated surface against the periphery of the first cooling
20 roller and thence with its coated surface against the periphery of the second cooling roller, and means for driving said coating and cooling rollers at the same peripheral speed.

25 6. A coating machine comprising a hollow coating roller having connections for the introduction of a heating medium thereinto, a pair of hollow cooling rollers having means for introducing a cooling medium
30 thereinto, guides for directing a paper strip first against the periphery of said coating roller, thence with its uncoated surface

against the periphery of the first cooling roller and thence with its coated surface
35 against the periphery of the second cooling roller, and a pan for containing a hot coating substance in which said coating roller is arranged to run, said pan having a steam chamber under its bottom, and a steam-jacketed melting pot having a feed pipe for
40 delivering to said pan.

7. In a coating machine, the combination with a coating roller and a co-operating pan for containing a coating material, of a
45 melting pot located above said pan and having a feed tube delivering thereto, said melting pot and pan having steam chambers and steam supply connections whereby they may both be kept hot and the coating material therein contained kept in fluid condition. 50

8. In a coating machine, the combination with a coating roller and a co-operating pan for containing a coating material, of a melting
55 pot located above said pan and having a feed tube delivering thereto, said melting pot and pan having steam chambers and steam supply connections whereby they may both be kept hot and the coating material therein contained kept in fluid condition,
60 said feed pipe having a manually operated valve.

In testimony whereof I affix my signature.

WILLIAM W. LATTA.