

**Sept. 24, 1935.**

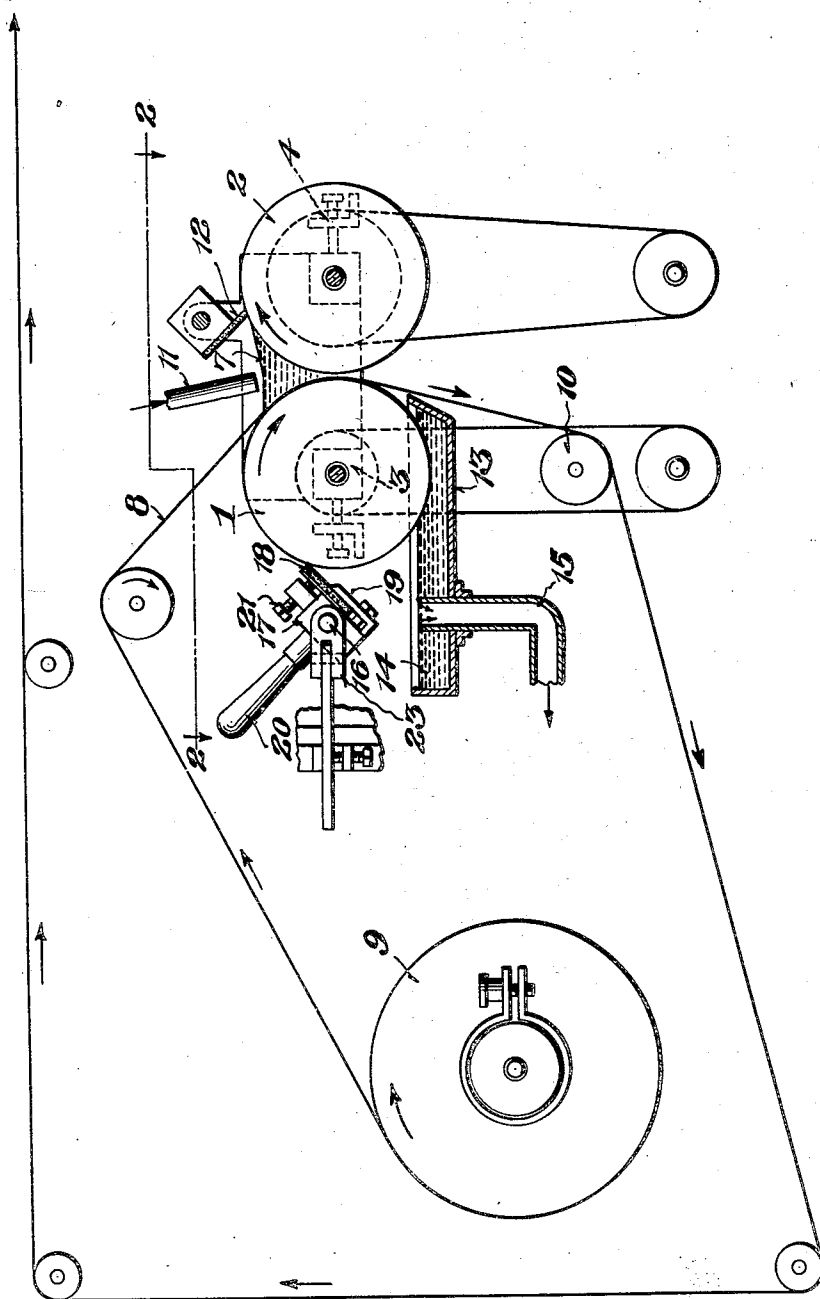
W. J. MONTGOMERY

**2,015,531**

# ROLL COATING MACHINE

Filed July 25, 1932

2 Sheets-Sheet 1



Inventor

*William J. Montgomery,*

By

K. P. McElroy

Attorney,

**Sept. 24, 1935.**

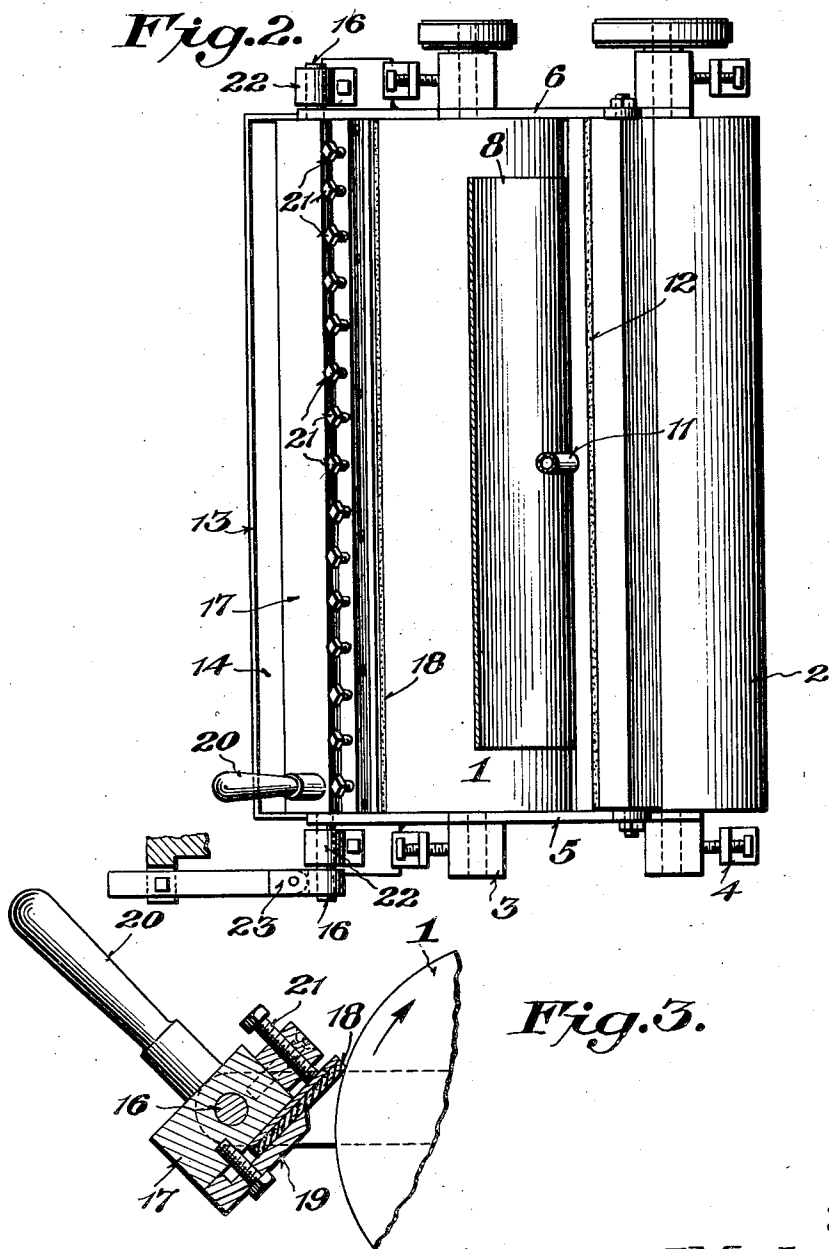
W. J. MONTGOMERY

**2,015,531**

# ROLL COATING MACHINE

Filed July 25, 1932

2 Sheets-Sheet 2



*Fig. 3.*

Inventor

*William J. Montgomery,*

By

K.P. McElroy

Attorney

## UNITED STATES PATENT OFFICE

2,015,531

## ROLL COATING MACHINE

William J. Montgomery, Hamilton, Ohio, assignor  
to The Champion Paper and Fibre Company,  
Hamilton, Ohio, a corporation of Ohio

Application July 28, 1932, Serial No. 624,589

5 Claims. (Cl. 91—48)

This invention relates to roll coating machines; and it comprises certain improvements in types of roll coaters adapted to apply in one operation a smooth uniform layer of coating material to a traveling web of paper, and having two cooperating rolls provided with end dams adapted to retain a pool of liquid coating composition between their upper adjacent quadrants, one roll serving to carry a moving web of paper downward through the pool and the other doctor roll driven in the same angular direction as the carrying roll serving to remove the excess coating composition from the paper, said improvement being in means for maintaining a clean surface on the carrying roll and comprising a liquid receiving pan into which the lower part of the roll extends and a wiper located between the pan and the web carrying surface, said wiper comprising a blade, advantageously of rubber, bearing on the carrying roll, a swinging clamp holding the blade, adjustable means causing the blade to bear with any desired pressure on points along the roll and to permit it to be swung clear of the roll when desired; all as more fully hereinafter set forth and as claimed.

In the field of making coated paper for fine printing purposes, Bradner in U. S. Patent 1,838,358 has described a process of coating paper in which a web of paper passes partly around a carrying roll which is at a small predetermined distance from another roll (doctor roll) which rotates in the same angular direction as the carrying roll and at a definite speed relative to the carrying roll. A pool of aqueous coating composition, (e. g., clay and casein mixture) through which the paper passes is maintained between the doctor roll and the carrying roll by means of end dams, the excess coating material being removed by the doctor roll.

When this machine is operated in accordance with the method described in said patent, an unusually good coating job is obtained, the resulting coated paper representing a decided improvement in the paper coating art. However, mill operation of this machine has revealed difficulties when differing widths of web are used and when certain defects in the paper stock are encountered. For example, when the paper stock contains a hole, such as, for example, a slime hole, coating composition passes through the hole and fouls the

carrying roll. This portion of coating composition is either transferred to the back of the web or dries out upon the carrying roll. In the latter case the hump or spot of dried coating raises subsequently passing paper at this point and causes a light spot on the coated paper due to insufficient weight of coating at this point. In either case defective paper results.

Also there are inevitable small sidewise movements of the web from time to time; weaving of the paper back and forth. Under these conditions coating may smear the back of the paper along the edges, or may dry on the carrying roll along the edges, producing a defective edge on the paper. This is particularly troublesome in splicing from one roll of paper to another as it is practically impossible to align successive rolls of paper sufficiently exactly. This difficulty is especially pronounced in going from a narrow web to a wider one. Also when the paper breaks, the carrying roll becomes covered with coating and it is necessary to wash this coating off and dry the roll before rethreading.

The object of the present invention is to provide apparatus to keep the surface of the carrying roll clean and thereby avoid and overcome defects in coating due to holes in the paper web, and the edge and other difficulties above mentioned; and this object is achieved in the apparatus herein-after described.

According to the present invention, provision is made to wet the carrying roll across its entire length below the web engaging surface, and then to wipe the roll clean at a point in advance of the place where the oncoming web contacts with the roll. To accomplish this, a pan containing a liquid, which is advantageously coating composition, is mounted just below the carrying roll and receives its lower periphery. Above the pool of liquid in the pan is mounted a special wiper engaging the roll and ensuring a clean surface at the time the web makes contact. In its best embodiment this wiper carries a blade of fairly soft rubber engaging the surface of the roll throughout its entire length.

In the accompanying illustration, I have shown the cleansing means of the present invention applied to a paper coater of the type illustrated in the acknowledged Bradner Patent 1,838,358. In this showing

Fig. 1 is an end view, certain parts being shown in section;

Fig. 2 is a fragmentary plan view along line 2-2 of Fig. 1; and

Fig. 3 is a detail showing the wiper on an enlarged scale.

In the showing of Fig. 1, elements 1 and 2 are a pair of adjacent rolls, both indicated as turning in a clockwise direction. Diagrammatically shown adjusting means 3 and 4 permit adjustment of the spacing between the rolls. At each end of the roll assemblage are mounted stationary dams (see Fig. 2) 5 and 6. These dams together with the adjacent upper quadrants of the two rolls, define a trough containing a pool of liquid 7. A traveling web of paper 8 coming from a stock roll of paper 9 passes downwardly through the pool on carrier roll 1 and away to driers (not shown), passing a positioning idler roll 10. The liquid flows into the pool and the excess coating is removed from the paper by the doctor roll 2. Liquid is supplied to the pool from a suitable source through conduit 11 and a scraper 12 keeps the surface of the doctor roll clean. All these elements are substantially as shown in the acknowledged Bradner patent.

In the present invention, a shallow pan 13 is mounted just below the carrying roll 1. The idler roll 10 keeps the traveling web of paper clear of the upper edges of the pan, allowing this edge to be located just below the point where the web leaves the roll. In this pan is shown a body of coating composition 14. Excess liquid can be taken by overflow 15 and pumping means (not shown) back to conduit 11. A rigid bar 17 having trunnions 16 is carried in the bearings 22. The bar 17 carries a blade member 18 of rather soft vulcanized rubber. This blade is clamped in place by clamp 19. The bar 17 is provided with handle 20 permitting the wiper to be swung into and out of engagement with the roll. Locking clamp 23 permits the blade 18 to be held firmly against the roll 1. In use, the blade wears somewhat and it may be necessary to move it forward to take up this wear. For this reason, the bar is provided with a series of screw adjusting means 21, located at intervals along its length (see Fig. 2). By means of these adjusting screws, local wear can be compensated for.

In starting up the apparatus under the present invention, the pan is first filled with coating composition. Care must be observed not to have the rubber wiper blade in contact with the carrying roll until the coating has wet the surface of the roll, as otherwise rapid wear on the wiper would result due to friction with a dry face. As soon as sufficient coating is supplied to the pan 13 to wet the surface of roll 1, the wiper may be locked in place. The coating composition acts as an excellent lubricant for the rubber wiper and the wiper does an excellent wiping job for long periods of time without any adjustment whatsoever.

Spoilage of paper due to holes in the web is reduced to the single sheet in which the hole exists, the wiper mechanism completely eliminating any further spoilage from this cause. This lubricated wiper also cleans the supporting roll from any wads of paper, dirt, etc., which

may accidentally be stuck upon the roll 1. The edges of the paper are not contaminated with coating on the back nor is there any defect on the edges on the coated side. Besides the face of the carrying roll is kept clean and dry permitting rapid threading of the paper.

Water alone may be used in place of coating composition in the pan, but on the whole, I find the use of the same coating composition as is being applied to the paper the most satisfactory. Also the wiping edge may be of suitable metal, bakelite, etc., but rubber is better.

What I claim is:

1. In a web coating machine, the combination with a doctor roll and a cooperating web carrying roll and means for driving these rolls in the same angular directions, of means for applying cleaning liquid across the whole length of the carrying roll and means to remove substantially all of the liquid thus applied prior to contact with the web.

2. An improvement in paper coating machines in which a continuous web of paper is carried on a rotating paper supporting roll and contacted with a body of fluid coating composition supported between said roll and another rotating roll, said improvement comprising the combination of said paper supporting roll with a container mounted below said roll and adapted to establish and maintain a liquid bath in contact with the lower periphery of said paper supporting roll and a wiper contacting with said paper supporting roll above said liquid bath, the wiper being adapted to clean off substantially all liquid from the roll prior to its contact with the web.

3. An improved machine as set forth in claim 2 in which the wiping element of said wiper is a rubber composition.

4. An improved wiper, suitable for use in the apparatus of claim 2, said wiper comprising a rubber blade and a supporting frame, said rubber blade being firmly attached to said frame, said frame being adjustable to permit changing the position of said rubber blade, and means for locally adjusting the rubber blade along its length.

5. The machine of claim 1 wherein the means for removing liquid from the carrying roll comprises a wiping device, the active engaging surface of which is rubber, mounted in an adjustable relation to the periphery of said rotating roll, said wiping device comprising a bar mounted parallel to the axis of said roll and capable of rotating on its axis, a rubber blade adapted to press on the surface of the roll and a flexible metallic blade forming a backing for said rubber blade, said rubber and metallic blades being detachably mounted on said bar with the metallic blade in contact therewith, by means of a clamp, a handle attached to said bar for rotating said bar and lifting the rubber blade from the roll, means for locking said bar in a given position, and a series of screws carried on said bar, the ends of said screws contacting said metal blade, said screws serving to locally adjust the position of said rubber blade and the pressure with which it bears on the surface of the roll.

WILLIAM J. MONTGOMERY.