

Nov. 14, 1950

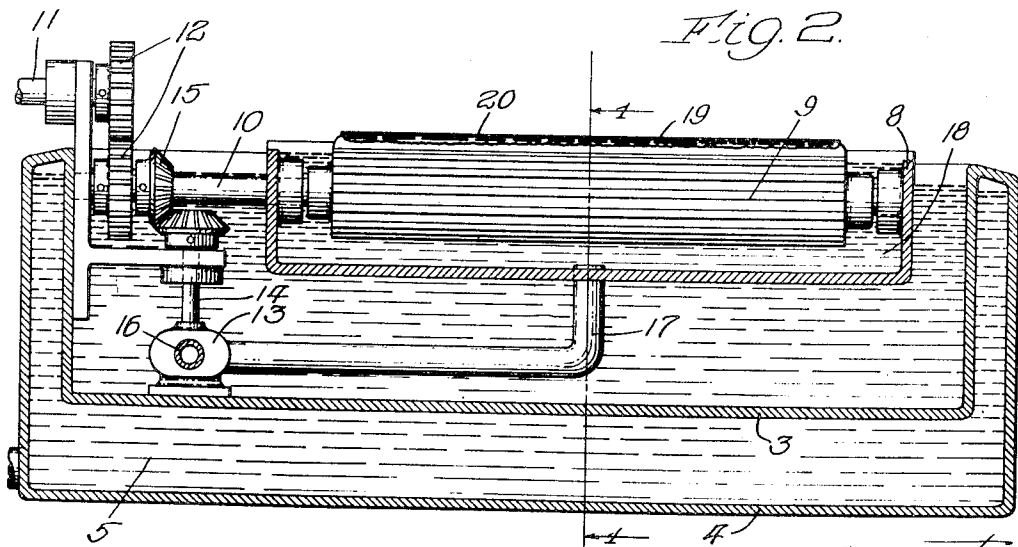
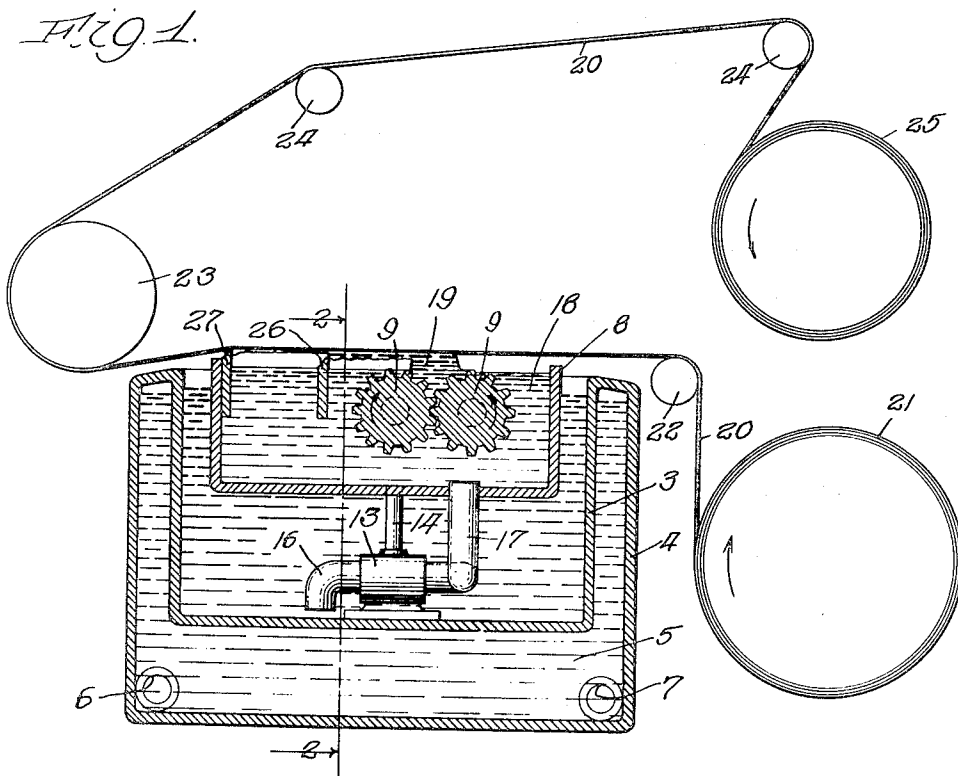
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2,529,699

APPARATUS FOR COATING PAPER WITH CARBON WAX

Filed Sept. 12, 1947

2 Sheets-Sheet 1



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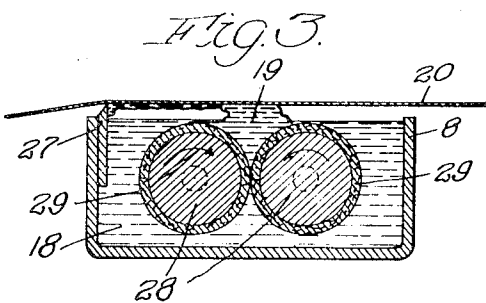
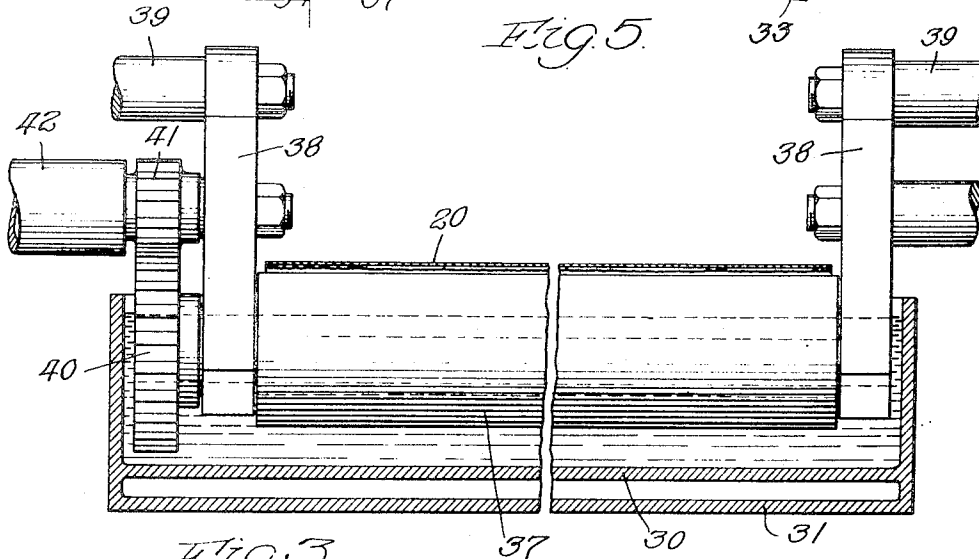
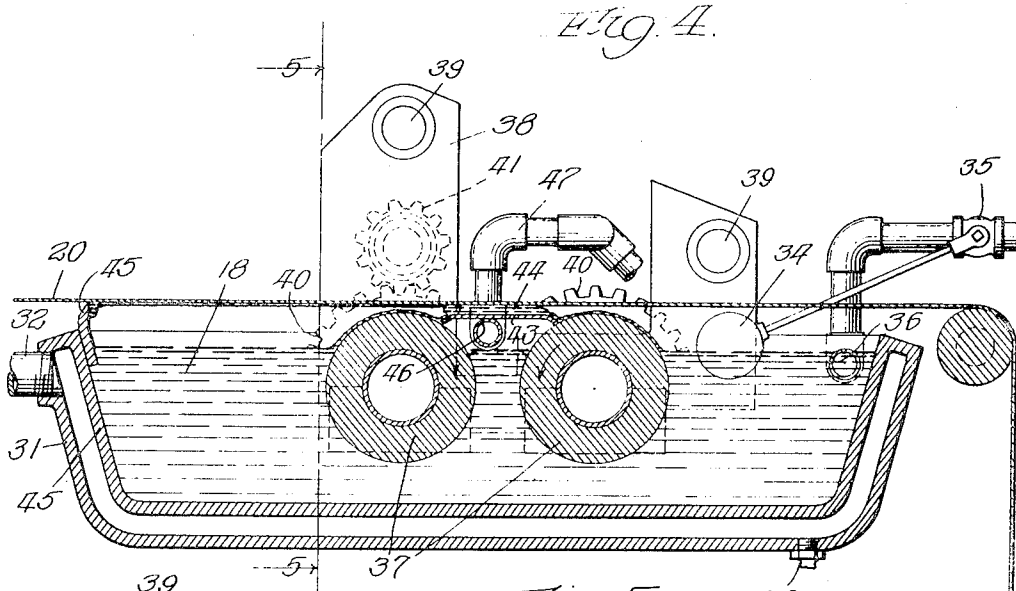
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APPARATUS FOR COATING PAPER WITH CARBON WAX

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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APPARATUS FOR COATING PAPER WITH CARBON WAX

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Application September 12, 1947, Serial No. 773,583

4 Claims. (Cl. 91—30)

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This invention relates to apparatus for applying carbon wax to one face of a continuous web of paper.

The primary object of the invention is to provide a simple and reliable apparatus for applying a uniform coating of carbon wax on a thin web of paper which is advanced from a supply roll, around a cooling drum onto a takeup roll.

A further object of the invention is to provide improved means for raising a ridge of molten wax into contact with the advancing web.

Another object of the invention is to provide improved means for keeping the wax at a substantially constant temperature, and to keep it circulating and maintaining a uniform mixture.

The present application is a continuation-in-part of my application Serial No. 581,633, filed March 8, 1945, and now abandoned.

The invention is illustrated in the accompanying drawings, in which:

Figure 1 is a diagrammatic vertical sectional view of apparatus embodying the invention, taken as indicated at line 1—1 of Fig. 2; Fig. 2, a broken vertical sectional view, taken as indicated at line 2—2 of Fig. 1; Fig. 3, a fragmentary vertical sectional view showing a modified roll construction; Fig. 4, a diagrammatic vertical sectional view showing a modified form of apparatus; and Fig. 5, a vertical sectional view, taken as indicated at line 5—5 of Fig. 4.

In the embodiment illustrated in Figs. 1 and 2, a container 3 is provided with a jacket 4, through which may be circulated water 5, or some other heating medium which is maintained at a constant elevated temperature by means of a suitable thermostatically controlled heating means, not shown. The liquid may be introduced through an inlet pipe 6 and withdrawn from an outlet pipe 7.

An open top pan 8 is supported in the container 3, and is provided with a pair of rolls 9 which are geared together so as to rotate in opposite directions. One of the rolls is provided with a drive shaft 10, and is driven from a shaft 11 by means of spur gears 12.

A small pump 13 is provided in the container 3, and is driven by a shaft 14 from the shaft 10 by means of bevel gears 15.

The pump constantly circulates liquid carbon wax from an inlet pipe 16 in a container to an outlet pipe 17, which communicates with the inside of the pan 8. Preferably the pump operates at a speed so that some of the wax overflows the edges of the pan 8 and runs back into the container 3.

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In the embodiment illustrated, the rolls 9 are shown with intermeshing toothed faces, which act like a gear pump in raising wax 18 from the pan, producing an elevated ridge-like portion 19 between and slightly above the rolls. It is this ridge which contacts the under face of a web 20 which is drawn from a supply roll 21 over an idler roll 22 and across the coating apparatus to a cooling roll 23, and thence over idler rolls 24 to a takeup roll 25. The cooling water may be circulated through the roll 23 to harden the carbon coating, so that it will not be tacky when it reaches the takeup roll 25.

The cooling pan is provided with a pair of doctor blades 26 and 27, the first blade serving to smooth out the coating on the under face of the paper, and the second blade to remove any excess of carbon before the web passes to the cooling roll 23.

It will be understood that the takeup roll 25 is driven in timed relation to the rolls 9 and the pump 13, so that a uniform product will be obtained. If desired, additional sets of rolls may be provided in the pan 8, and if it is desired to coat both faces of the web, another coating machine may be provided between the idler rolls 24.

In the modification shown in Fig. 3, instead of using elongated gear wheels, a pair of rolls 28 are used which are covered with a resilient material 29, such as felt, and will perform the function of providing a ridge of wax 19 to contact the advancing web.

As the coating wax is used up, it may be replenished from time to time by adding wax into the container 3. However, the pump 13 keeps the pan 8 full to a constant level, which is desirable in order that the ridge 19 is kept constant.

In the modification shown in Figs. 4 and 5, a liquid wax pan 30 is provided with a steam jacket 31 having an inlet pipe 32 and a drain 33. Liquid wax 18 is maintained at a substantially constant level by means of a float 34 controlling a valve 35 on a wax inlet pipe 36.

A pair of rolls 37 are smooth and are journaled in brackets 38 which are carried by rods 39. When it is desired to clean the pan, the pan may be lowered away from the rolls by mechanism, not shown.

The rolls are arranged in adjacent but spaced relation, and are geared to rotate, as indicated by the arrows, by intermeshing gears 40, which are driven by a gear 41 on a shaft 42. A plate 43 is maintained between the rolls and closely adjacent to them, so that the wax 18 will be carried

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by the rolls to the upper side of the plate and a ridge of wax 44 will be maintained on the plate 43 above the tops of the rolls 37. A blade 45 is provided above the rolls for removing excess wax from the under face of the web.

As shown in Fig. 4, a steam pipe 46, provided with suitable connections 47, is provided between the rolls and underneath the plate to help maintain the liquid wax at a uniform temperature which is higher than room temperature.

By bringing the paper into contact with a ridge of wax maintained between and above the rolls, the liquid carbon wax does not travel through minute pores of the paper and thereby reach the wrong face of the paper, as frequently happens when the paper is brought into direct contact with a carbon coating roll.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. Apparatus for coating paper with carbon wax comprising: a pan for holding a quantity of liquid wax; means for maintaining the liquid wax in said pan at a temperature above room

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temperature; a pair of adjacent driven rolls dipping into the wax and rotating in opposite directions; a plate mounted between said rolls and closely adjacent thereto so that wax will be carried by the rolls to the upper side of said plate and a ridge of wax will be maintained on the plate above the tops of the rolls; and means for drawing a web of paper above the tops of the rolls and into contact with the ridge of wax, said web traveling in timed relation to the movement of the rolls.

2. Apparatus as specified in claim 1, in which a blade is provided over said pan for removing excess wax from the under face of the web.

3. Apparatus as specified in claim 1, in which automatic valve means is provided for maintaining the wax in the pan at a substantially uniform level.

4. Apparatus as specified in claim 1, in which the means for maintaining the liquid wax at elevated temperature includes a heated jacket outside of the pan, and a closed heating conduit between the rolls and beneath the plate.

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No references cited.