

[54] **METHOD OF COATING PAPER OR OTHER SHEET MATERIAL WITH SURFACE LAYERS OF DIFFERENT COATING COMPOSITIONS**

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[22] Filed: **Feb. 28, 1973**

[21] Appl. No.: **336,777**

[30] **Foreign Application Priority Data**

Mar. 13, 1972 Sweden..... 3150/72

[52] U.S. Cl. **427/211; 427/356; 427/361**

[51] Int. Cl.² **B05C 9/04**

[58] Field of Search 117/68, 111 F, 111 R;
118/204

[56] **References Cited**

UNITED STATES PATENTS

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[57] **ABSTRACT**

A method of coating paper or other sheet material with surface layers by applying different coating compositions to each side of a travelling sheet by feeding the sheet between two opposed members defining a press nip formed of a resilient thin blade having a sharp edge engaging the sheet as one member of the press nip, and a rotatable roller supporting the sheet on one side as the other member of the press nip. A first coating composition is applied to one side of the sheet from a dam defined on one side by the sheet and on the other side by the blade, whereas the second coating composition is applied to the opposed side of the sheet by means of contact transfer of said second coating composition, which has been previously applied to the surface of the roller.

2 Claims, 3 Drawing Figures

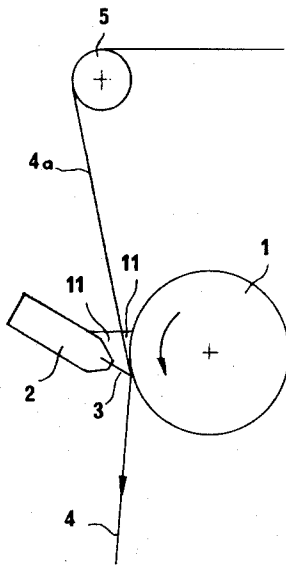


FIG. 1

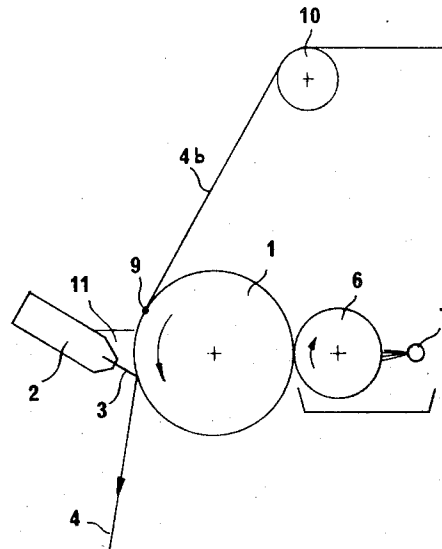


FIG. 2

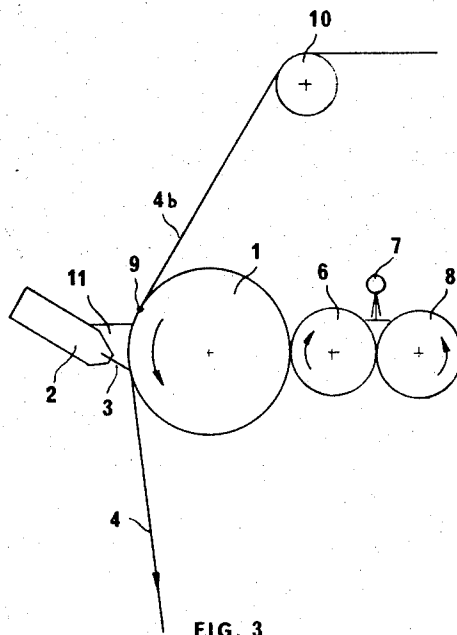


FIG. 3

METHOD OF COATING PAPER OR OTHER SHEET MATERIAL WITH SURFACE LAYERS OF DIFFERENT COATING COMPOSITIONS

According to a known method, described in U.S. Pat. No. 3,489,592, a satisfactory coating result can be obtained by guiding a web of material, for example paper, in a substantially vertical direction downwardly through a press nip which is formed between a thin, flexible blade in the form of, for example, a steel blade with a sharp edge and a rotating roller; the space between the blade and the roller forming a dam filled with the coating composition. Immediately after passing through said nip the paper web is deflected toward the side at which the blade is located, so that an angle is formed between the tangent of the roller and the downward passing portion of the web thereby avoiding a film splitting. This known method however only permits the use of the same coating compositions on both sides of the paper web. The reason for this is obvious and is due to the fact that the same dam surrounds the paper web and that it has been found extremely difficult to arrange a suitable device to separate the dam, for example into two dams, one for each side of the web, so as to permit a coating with different coating compositions on each side of the paper web.

The present invention intends to exploit the favourable effects of this known blade coating method, while avoiding the disadvantages in that this known method does not permit coating with different coating compositions on opposite sides of the paper web.

According to the present invention a first coating composition is applied to the side of the sheet facing the blade from a dam defined on one side by the sheet and on the other side by the blade and a second coating composition is applied to the opposite side of the sheet abutting the roller by means of contact transfer of said second coating composition, which has been previously applied to the surface of the roller.

Further features and advantages of the invention will be apparent from the following description of embodiments thereof given by way of example with the accompanying drawings, in which:

FIG. 1 shows a prior art device according to U.S. Pat. No. 3,489,592

FIG. 2 shows an apparatus for performing the present invention and

FIG. 3 shows a further apparatus suitable for performing the present invention.

In FIG. 1 the reference numeral 4a indicates the path of a paper web before the nip between a blade 3 — which is attached in a blade holder 2 — and a rotating roller 1. The path of the paper web after passing the nip has been indicated by reference numeral 4, and 5 indicates a guide roller. According to this prior method particularly good results have been obtained when blades in the form of steel blades with a sharp edge and a thickness of between 0.2–0.7 mm are used.

It should be clear from FIG. 1 that this prior art device only permits the use of the same coating compositions on both sides of the paper web. The reason for this is obvious and is due to the fact that in this device the same dam 11 surrounds the paper web. In practice it has been found extremely difficult to arrange a means to separate the dam 11, for example into two separate dams, one for each side of the web, so as to permit coating with different coating compositions.

The present invention relates to a method of enabling simultaneous coating of both sides of the paper with two different compositions without the compositions being mixed. FIG. 2 shows a paper guide roller 10, over which the paper web 4b is led generally downwardly towards the coating means. The paper web meets the roller 1 at a point 9, this point lying above the horizontal surface of the coating composition in the dam 11 which is formed between the blade 3 in the holder 2 and the roller surface 1.

The paper web is drawn over the blade edge 3 at an obtuse angle with respect to the roller radius at the point of contact of the blade with the roller. A second rotating roller 6 is pressed with a suitable pressure against the roller 1. A device 7 sprays the desired second coating composition onto the roller 6 which distributes and transfers a certain amount of the composition onto the roller surface 1.

At the contact point 9 the transfer of the second coating composition from the roller surface 1 to the side of the paper facing the roller surface is initiated, partially in the form of absorption. By suitable choice of base paper, speed, coating composition and the quantity of this coating composition supplied, the desired quantity of coating composition can be transferred to the surface of the paper web without any excess being pressed out, for example laterally, before the nip in the dam, thus causing the compositions to mix. In order to prevent a mixing of the different coating compositions, it is also advisable to ensure that the second coating composition applied on the roller 1 is limited laterally so that it has the same width as the paper web 4b or is narrower. This can be achieved, for example, by making the roller 6 narrower than the paper web 4b or by providing the roller with suitable scraping means to remove the coating composition along each edge of the roller 1 or 6.

The side of the paper facing away from the roller 1 is coated with a first coating composition in the dam 11 in conventional manner, i.e. the blade 3 doses and smoothes out the coating composition on this side of the paper.

It is easily understood that the arrangement described permits different coating compositions to be coated on each side of the web without risk of the compositions becoming mixed.

Various arrangements are feasible within the scope of the invention for applying the coating compositions on the roller side and FIG. 3 shows a different embodiment where reference numerals 6 and 8 indicate two distributing rollers which can preferably be adjusted in relation to each other and the roller 1 and which can preferably be run at different speeds. The second coating composition is supplied through the pipe 7 and the arrangement shown permits careful control of the layer of the second coating composition applied on the roller surface 1.

What I claim is:

1. A method of coating paper or other sheet material with surface layers by applying different coating compositions to both sides of a moving sheet by feeding the sheet between two opposed members defining a press nip formed of a resilient thin blade having a sharp edge comprising one member of the press nip and a rotatable roller supporting the sheet on one side comprising the other member of the press nip, said steps comprising:

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applying a first coating composition to one side of the sheet by means of contact transfer of said first coating composition, which is applied to the surface of said roller; said first coating applied to said roller being limited laterally so that the width of the applied layer is narrower than the width of the sheet; applying a second coating composition to the other side of the sheet from a dam arranged above the press nip and defined on one side by the sheet and on the other side by the blade; said sheet being brought into engagement with the surface of said

roller before entering said nip to prevent the first coating composition from entering the dam and thus being mixed with the second coating composition in said dam.

2. The method of claim 1 further comprising the step of deflecting the sheet at an angle to its direction of travel over the sharp edge of said thin blade to prevent the coating formed by the first coating composition from peeling.

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