# United States Patent [19]

**Robertson**

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[54] **BACK ROLL CLEANING APPARATUS AND METHOD**


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[51] **Int. Cl.**..... **B08f 7/00,** B05c 11/00

[58] **Field of Search**..... 134/6; 117/111 R, 111 A, 117/111 B, 111 H, 66; 118/70, 203, 104; 101/425; 15/256.51



[56] **References Cited**

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[57] **ABSTRACT**

A back roll cleaning apparatus and method is provided employing a rotatable cleaning roll, having a resilient covering carrying a liquid cleaning medium for rinsing and scrubbing said back roll, urged into engagement with said back roll under predetermined pressure across a plane passing through the axis of rotation of each of said rolls to avoid stripping and other contamination of a web by the action of the back roll.


**4 Claims, 2 Drawing Figures**

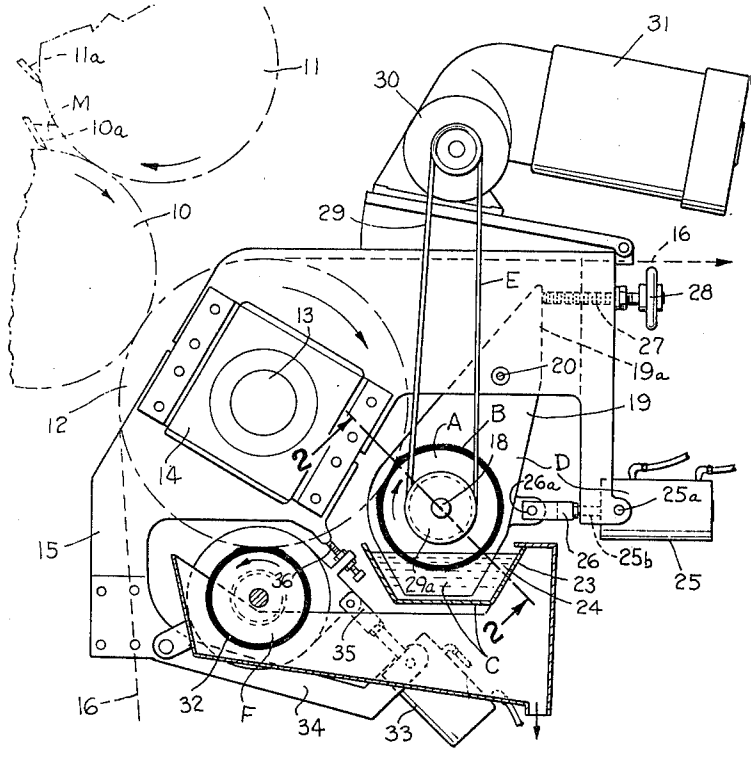
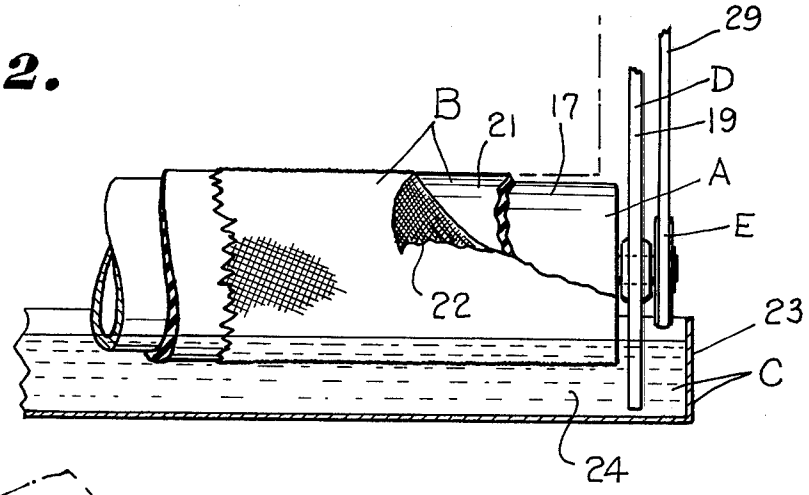


Fig. 2.


29
D
19
A
E
B
21
17
22
23
C
24

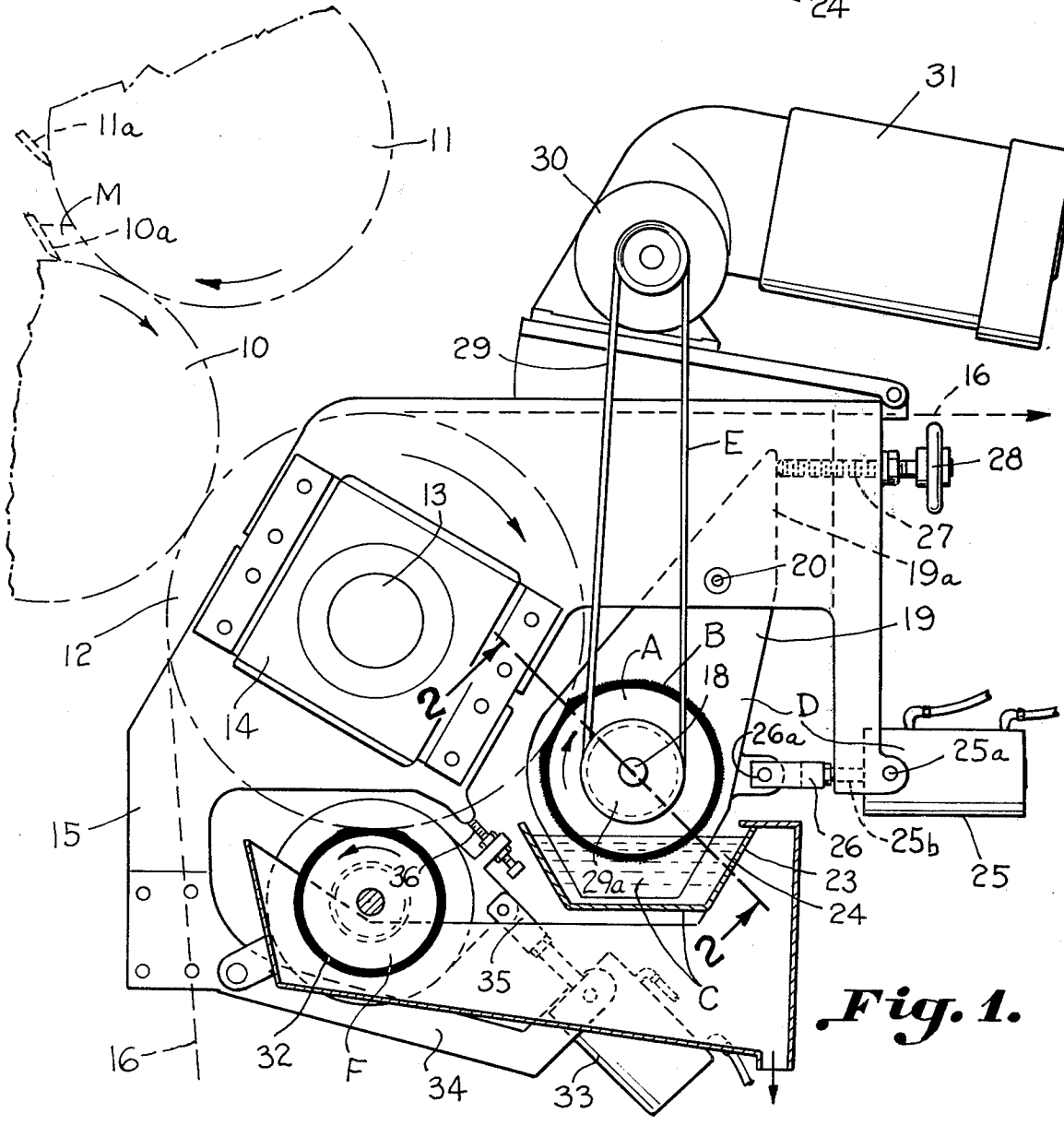

11a
11
M
A
10a
10
31
30
29
16
E
28
27
19a
20
19
13
12
A
B
18
D
26a
25a
14
2
1
15
36
29a
23
24
26
25b
25
35
C
2
16
32
F
34
33

Fig. 1.

# BACK ROLL CLEANING APPARATUS AND METHOD

## BACKGROUND OF THE INVENTION

In the application of a liquid coating material, such as latex, to a web, such as drapery material, a back coater or reverse roll coater is often used. Other similar coating devices include a knife over roll coater for applying a coating to a web. In such instances applicator means apply a liquid coating material across one side of a web, while a rotatable back roll opposite and aligned with the means for applying the liquid coating carries the other side of the web. The coating material sometimes penetrates the web causing a build-up of coating material on the back roll resulting in stripping and otherwise contaminating the web material being treated. Operating losses from the second quality material produced are substantial.

In an effort to solve this problem a prior practice has been to engage a workman whose job it is to continuously wash the back roll with water. These efforts are costly, laborious, only partially effective in removing contaminating particles and often result in water damage to the web due to insufficient drying of the back roll.

Roll cleaning devices have been applied to other rolls such as disclosed in U.S. Pat. Nos. 2,731,916 and 3,592,136, as well as to drafting rolls as exemplified by U.S. Pat. No. 2,730,770. The cleaning rolls of such devices are covered with highly degradable material such as cork. Such cleaning rolls have a tendency to themselves become fouled with foreign matter removed in the cleaning. It was hitherto thought impossible by those skilled in this field to make a cleaning roll applicable to such problems. This is evidenced by the extreme measures undertaken to only partially solve the problem.

## SUMMARY OF THE INVENTION

It has been found that an effective solution to the problem may be achieved through the use of a driven cleaning roll having a resilient covering urged against the back roll for rinsing and scrubbing same and then effectively drying the back roll ahead of the applicator.

Accordingly, it is an important object of this invention to clean a back roll during a web coating operation by effective automatically operable means.

Another important object of this invention is the provision of an effective roll cleaner employing a cleaning roll with a covering capable of carrying out the operation for reasonable periods of time.

Another important object of the invention is the provision of means for applying a force urging the cleaning roll against a rotating roll along a plane passing through the axis of rotation of both rolls.

Still another object of the invention is the provision of a method of cleaning a rotating roll, wherein, the rotating roll is effectively rinsed, scrubbed and dried.

## BRIEF DESCRIPTION OF THE DRAWING

The construction designed to carry out the invention will be hereinafter described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification, and by reference to the accompanying drawing forming a part



thereof, wherein an example of the invention is shown and wherein:

FIG. 1 is a schematic side elevation, partially in section, illustrating a back roll coater equipped with a roll cleaning apparatus carrying out the method in accordance with the invention, and

FIG. 2 is a transverse sectional elevation taken on the line 2—2 in FIG. 1, with parts omitted, for clarity of illustration.

## DESCRIPTION OF A PREFERRED EMBODIMENT

The drawing illustrates a web coating apparatus having applicator means for applying a liquid coating material across one side of a web and a rotatable back roll opposite and aligned with the means for applying a liquid coating carrying the other side of the web. A cleaner for said back roll, avoiding contamination thereof during a coating operation includes a rotatable cleaning roll A aligned with the back roll opposite the applicator means. A resilient covering B is carried on the rotatable cleaning roll. Means C are provided for supplying a liquid cleaning medium to the resilient covering for application thereby to the back roll and for removing contaminants from the resilient covering. Means D urge the cleaning roll into engagement with said back roll under predetermined pressure compressing the resilient covering. Driving means E rotate the cleaning roll with respect to the back roll. Means F are provided for removing liquid cleaning medium applied to the back roll by the resilient covering aligned therewith and positioned ahead of the applicator means. Thus, stripping and other contamination of the web resulting in an inferior product is avoided.

The web coating apparatus is illustrated schematically as including a supply roll **10** which receives a liquid coating material M confined by a material dam **10***a*. The metering roll **11**, having a cleaning doctor blade **11**a, controls the amount of coating material applied to the supply roll **10** through the metering gap between the rolls **10** and **11**. The liquid coating material may be in the form of a slurry, or in any liquefied condition as may be applied through the use of an applicator roll. Viscous materials are often applied to drapery materials, for example, such as latex or flame retarding coatings. Devices, such as illustrated, may be used for any purpose wherein a web is treated through the application of a backing or coating material. Such applications include, but are not limited to the application of a backing or coating, as to drapery materials.

The web coating apparatus further includes a driven back roll **12** having a shaft **13** carried in a bearing block **14**. The frame **15** is supplied for carrying the components comprising the cleaner attachment set forth herein. The web **16** is illustrated as passing over the back roll **12** in the direction of the arrow. The web **16** thus passes between a nip formed by the supply roll **10** and the back roll **12**.

As is often the case with such an operation, the coating material may penetrate the web so as to form a coating build-up upon the back roll. This build-up results in the application of uneven pressure producing stripping or other adverse effects in the web being treated.

The rotatable cleaning roll A, preferably includes a shell **17** (FIG. 2) carried upon a shaft **18** (FIG. 1) which is journalled in a pair of spaced depending brackets **19**. These brackets are pivotally mounted as

at **20** for carrying the rotatable cleaning roll A as will be described in greater detail below.

The roll A carries a resilient covering B. The resilient covering B includes a hard rubber coating **21** as well as a fabric cover **22.** The resilient coating **21** may be of rubber having a Durometer hardness of about **40** which is preferably impervious to the liquids involved in the coating operation, as well as those involved in the cleaning operation described herein. Preferably, the coating **21** is somewhat softer than the covering of the back roll **12.** The fabric cover may be provided in the form of a circular knit seamless cotton sleeve and the like. Means C for supplying a liquid cleaning medium, such as water, or perhaps a volatile solvent includes a tray or trough **23** for carrying a bath of liquid **24.** The rotatable cleaning roll A is illustrated as being immersed at all times within the bath **24.**

Fluid operated means D are provided adjacent each end of the cleaning roll A for urging the cleaning roll into engagement with the back roll including an air cylinder **25** which is connected through suitable linkage **26** to the depending brackets **19.** The air cylinders **25** urge the linkage **26** toward the left-hand side of FIG. **1** compressing the resilient covering B carried by the roll A as will be discussed in greater detail below.

It is important to note the fabric cover and rubber coating are urged against the back roll **12** placing it under maximum compression. The fabric cover wipes the roll surface clean after which the rubber backing expands thus fragmenting particles which are removed from the surface of the back roll. Then the removed particles are washed from the fabric cover **22** and disposed in the solution. After scrubbing or wiping the sleeve **22** rinses the back roll **12.**

It will be noted that the cylinder **25** has pivoted connection with the frame **15** as at **25***a* and a piston (not shown) has a piston rod **25***b* having connection with the linkage **26.** The linkage **26** has a pivoted connection as at **26***a* with the depending brackets **19.** By means of these pivoted connections the force exerted by the air cylinder is self-adjusting to act through a plane passing through the respective longitudinal axis of rolls **12** and A. Thus, wear on the rolls may be compensated for avoiding binding of the rolls and facilitating a rinsing action by the sleeve following a scrubbing action applied along the plane through which the force is exerted. It should also be noted that a threaded stop element **27** is adjustably positioned by the hand wheel **28** for engagement with an upwardly extending portion **19***a* of the depending brackets **19** to fix the position of the cleaning roll A with respect to the back roll **12.** Drive means E for rotating the cleaning roll include a belt **29** driven by a variable speed drive **30** from the motor **31.** The belt **29** drives a pulley **29***a* carried by the shaft **18.** If increased cleaning action is required, the roll A may be overdriven to any desired speed with respect to the back roll **12.**

The means F for removing liquid cleaning medium applied to the back roll for drying same includes a pressure roll **32** which is urged by the cylinder **33** into engagement with the back roll causing the cleaning solution to pour down the front surface thereof into a reservoir formed by the pan **34.** It will be observed that the cylinder **33** is suitably positioned to urge the roll **32** into contact with the back roll through suitable linkage **35.** A threaded stop **36** is also provided for limiting the engagement of the roll **12** by the drying roll **32.** Pivoted connections, similar to those described above, are provided for permitting self-adjustment of the force provided by the air cylinder **33** causing it at all times to pass through the axis of rotation of rolls F and **32.** While the back roll may not be required to be completely dry, the action of the drying roll is important in insuring uniform moisture content in the web.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

I claim:

**1.** For use in a web coating apparatus having applicator means for applying a liquid coating material across one side of a web and a rotatable back roll opposide and aligned with said means for applying a liquid coating carrying the other side of said web, a cleaner for said back roll avoiding contamination thereof comprising:

A. a rotatable cleaning roll aligned with said back roll opposite said applicator means;

B. a resilient compressible coating over said cleaning roll substantially impervious to said liquid cleaning medium;

C. a fabric sleeve over said resilient coating;

D. means supplying a liquid cleaning medium to said cleaning roll for application thereby to said back roll and for removing contaminants from said resilient covering;

E. means urging said cleaning roll into engagement with said back roll under predetermined pressure sufficient to compress said resilient coating;

F. driving means rotating said cleaning roll with respect to said back roll; and

G. means aligned with the back roll and positioned ahead of said applicator means for removing liquid cleaning medium applied to said back roll by said resilient covering;

whereby said resilient coating and the sleeve carried thereby expands after engagement with the rotating roll dislodging foreign particles from the sleeve facilitating removal therefrom by said means supplying a liquid cleaning medium.

**2.** The cleaner set forth in claim **1,** wherein said means supplying liquid cleaning medium is a trough in which said cleaning roll is immersed in the medium.

**3.** The cleaner set forth in claim **1,** wherein said means urging said cleaning roll into engagement is self-adjusting acting on a plane passing through the longitudinal axis of each of said rolls.

**4.** The cleaner set forth in claim **1,** wherein the means for removing liquid cleaning medium is an aligned roll urged against the back roll causing liquid cleaning medium deposited on the back roll to pass down the face thereof.

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