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Howe et al.

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[54] **ROLLER APPLICATOR**

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[52] **U.S. Cl.** **118/223**

[51] **Int. Cl.** **B05c 1/08**

[58] **Field of Search** 118/246, 244, 223, 637, 118/DIG. 23; 354/318, 331

[56] **References Cited**

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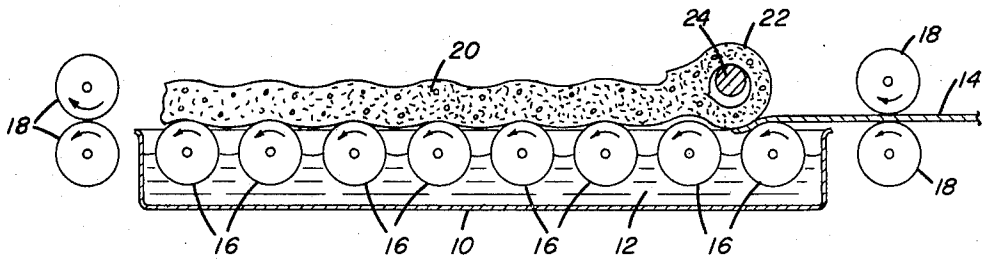
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[57] **ABSTRACT**

A surface application processing device for processing sheets and/or webs of material in which a soft, flexible blanket rests on one or more solution-applying rollers partly immersed in a processing solution. The blanket ensures good contact between the solution-applying rollers and the undersurface of a material being processed thereby.

7 Claims, 2 Drawing Figures



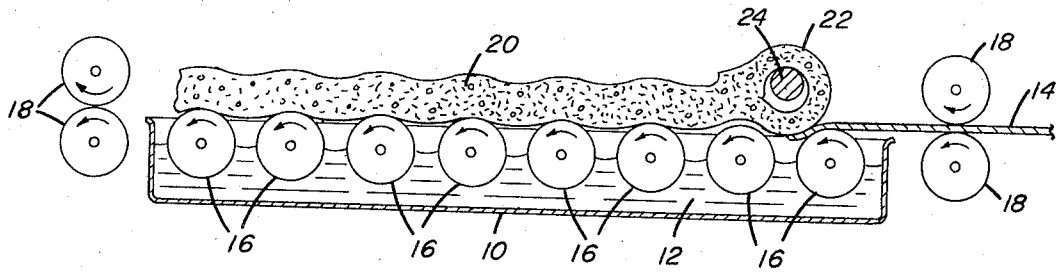

24
22
20
18
18
14
16
16
10
16
12
16
18

FIG. 1

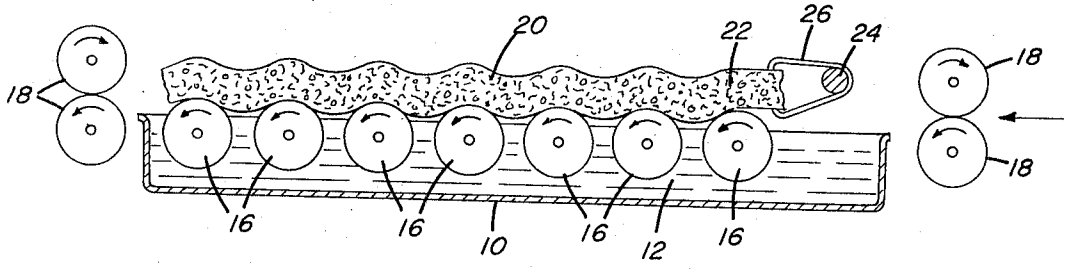

20
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FIG. 2

ROLLER APPLICATOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to processing devices, and more specifically to a surface application processing device for processing sheets and/or webs of material.

2. Description of the Prior Art

Surface application processing devices of the type in which a sheet and/or web of material to be processed is advanced by transport rollers over solution-applying rollers partially immersed in a processing solution are well known in the art. Such processing devices are particularly applicable to the photographic processing field. In such processing devices, the processing solution is applied to the undersurface of the moving material at one position and is removed at another position, the sheet being moved at a suitable speed for the desired processing operation, or stage of the operation, to be completed between these two positions. The processing solution is applied to the undersurface of the material by a roller partially immersed in the solution, or by other solution applications means known in the art. To achieve proper processing, it is important that the moving material be correctly position, or guided in relation to the solution application means. A known sheet or material guiding means comprises a rigid guide spaced from and above the rollers, and the upper surface of the material engages such guide during transport of the material through the device. Such guide can cause surface abrasion of the sheet being processed under some circumstances, and must be precisely positioned for optimum processing results. Such precise positioning of thhe guide is difficult to achieve, and when achieved does not uniformly press or hold the material in intimate engagement with the solution applying rollers.

SUMMARY OF THE INVENTION

In accordance with a preferred embodiment of the invention, a surface application processing device is disclosed comprising means for guiding a transported material to be processed into intimate engagement with solution-applying means, such as rollers partially immersed in a processing solution. In a preferred embodiment of the invention, the guiding means comprises a flexible blanket anchored at the material inlet end of the processing device to prevent movement of the blanket through the processing device with the material. The flexible blanket is preferably constructed from a cellular foamed material such as rubber or the like, and in the absence of a material to be processed above the rollers tends to assume an undulating shape. The blanket is anchored adjacent the material inlet end of the processing device, and flexes along its length.

Some of the advantages of the material guiding means of this invention is its simplicity and ease of manufacture, and the elimination of the necessity for holding the guiding means to precise or close tolerances. Furthermore, such material guiding means is believed to more uniformly press the entire surface of flexible materials fed through the processing device into intimate engagement with the solution application means, thereby resulting in increased processing uniformity.

It is, accordingly, one of the objects and advantages of the present invention to provide an improved material guiding means for a surface application processing device that is of simple design and construction, thoroughly reliable and efficient in operation, and economical to manufacture.

Another object and advantage of the invention is to provide an improved material guiding means for a surface application processing device that eliminates the necessity of constructing the guide means to precise dimensions and close tolerances.

Another object and advantage of the invention is to provide an improved sheet guiding means for a surface application processing device that uniformly presses flexible materials fed through the device into intimate engagement with the solution application means, thereby resulting in increased processing uniformity.

The invention and its objects and advantages will become more apparent from the detailed description of the preferred embodiment presented below.

BRIEF DESCRIPTION OF THE DRAWINGS

In the detailed description of the preferred embodiment of the invention presented below, reference is made to the accompanying drawing, in which:

FIG. 1 is a side elevational view partly in section schematically illustrating a preferred embodiment of the surface application processing device of this invention; and

FIG. 2 is a view similar to FIG. 1 illustrating a different latching means for latching one end of the blanket to a fixed support.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Because surface application processing devices are well known, the description will be directed in particular to elements forming part of, or cooperating more directly with, apparatus in accordance with the present invention. Elements of the processing device not specifically shown or described herein should be understood to be selectable from those known in the art.

With reference to the drawing, a preferred embodiment of the surface application processing device of this invention comprises a shallow tray **10** containing a processing solution **12** which is to be applied to the undersurface of a material **14** to be processed, such as a photographic sheet and/or web. The surface of the photographic material, may, for example, have a photographic developer incorporated in its coating, and a solution to be applied to the surface may comprise an activator for this developer, or a stabilizer. The means for applying the processing solution to the undersurface of material **14** comprises a plurality of solution applying rollers **16** mounted by any suitable means for rotation with portions of the rollers partially immersed in the processing solution **12** for picking up a layer of solution and applying it to the material upon rotation of the rollers. The rollers **16** are preferably journaled in supports, not shown, in parallel relation to one another, and horizontally spaced along the length of tray **10**. a pair of opposed, pressure transport rollers **18** comprising one roller supported vertically above another roller are suitably mounted at the material inlet end of tray **10** for transporting a material **14** to be processed over solution applying rollers **16** toward a similar pair of transport rollers **18** at the outlet end of the device for

transporting the processed material out of the processing device.

To ensure optimum contact between solution applying rollers **16** and material **14** being processed, a flexible blanket **20** rests on all of the rollers **16** when the material is not present, taking the shape of the upper portions of these rollers, and capable of being separated from the rollers by material **14** transported therebetween. The blanket **20** is substantially rectangular, and at least as wide as the material to be processed, and the blanket end **22** nearest to inlet rollers **18** is anchored or fastened to a rod **24** which extends across the width of tray **10,** and is mounted by any suitable means on the processing device. The end **22** of blanket **20** is looped over rod **24** and secured to the upper side of the blanket to provide anchorage against longitudinal movement of the blanket. In FIG. **2** another form of blanket fastening means is illustrated comprising a plurality of spaced loops **26** of filamentary material such as textile, polymer or wire material securing blanket end **22** to rod **24.** Although transverse movement of blanket **20** along anchorage rod **24** is limited, a slight longitudinal movement of blanket end **22** toward or away from the leading solution applying roller **16** is permitted to facilitate entry below blanket end **22** of the material to be processed, and to urge the material **14** lightly into engagement with this roller. The remainder of blanket **20** is free to be moved vertically by the material **14** passing thereunder, and maintains the material in intimate light pressure engagement with solution applying rollers **16.** Thus the blanket **20** provides a self-adjusting material guiding means.

A suitable material for blanket **20** is a flexible, closed cell, foamed rubber sheet, a thickness of one-eighth inch being found suitable in one processor. Other materials, such as polyethylene of approximately 0.02 inch thickness can also be used. The blanket **20** may resist flexure across its width more than across its length. The anchorage rod **24** and the looping of the blanket material around the rod produces a stiffening of blanket **20** to resist flexure across the width at the entry end of the blanket. Further stiffening may be provided by transverse ribs, not shown, formed on or attached to blanket **20** at preferably longitudinally spaced points of the blanket.

The solution applying rollers **16** are driven in the direction indicated in the drawing by any suitable drive means, not shown, to apply a film of solution to the undersurface of material **14** transported between blanket **20** and rollers **16** by the transport rollers **18.** Thus, the solution applying rollers **16** may rotate in the same direction as the lower transport rollers **18,** but preferably at a slower speed, or they may be driven to rotate in the opposite direction.

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove.

We claim:

1. In a surface application photographic processing device for processing the exposed photosensitive surface of a web or sheet of material by applying thereto a layer of processing solution, the combination comprising:

a container for holding a processing solution;

a plurality of spaced apart, rotatably driven rollers partially immersed in the processing solution for transporting a material through the processing device and simultaneously applying the processing solution to one surface of said material in engagement with said rollers for processing said material during its transport; and

a flexible blanket supported by said rollers for engaging the opposite surface of said material and guiding said material with said one surface thereof pressed and held into intimate engagement with said rollers.

2. The invention according to claim **1** wherein said device further has a material inlet end and a stationary support adjacent said inlet end, and said flexible blanket has an elongated opening at one end for receiving said support, and its opposite end free.

3. The invention according to claim **2** wherein said support comprises a rod, and said opening is enlarged relative to said rod to allow slight movement of said one end of said blanket relative to said rod.

4. The invention according to claim **1** wherein said device further has a material inlet end and a stationary support adjacent said inlet end, and said blanket comprises a sheet of foamed material having one end secured to said stationary support and its opposite end free.

5. The invention according to claim **4** wherein said stationary support comprises a rod extending through an elongated opening at said one end of said sheet of foamed material.

6. The invention according to claim **5** wherein said opening is enlarged relative to said rod to allow slight movement of said one end of said blanket relative to said rod.

7. The invention according to claim **4** wherein said stationary support comprises a rod, and said sheet of foamed material is connected to said rod by spaced loops of filamentary material.

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