

# RESERVE COPY PATENT SPECIFICATION

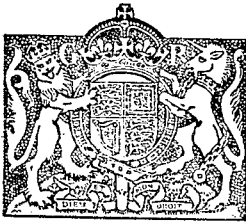
377,286

Application Date: April 24, 1931. No. 12,169/31.

(Patent of Addition to No. 321,222: dated Aug. 3, 1928.)

Complete Left: Dec. 24, 1931.

Complete Accepted: July 25, 1932.



## PROVISIONAL SPECIFICATION.

### Improvements in or relating to Apparatus for Applying Liquid Coatings to Surfaces, particularly the Surfaces of Flexible Strip Material.

We, CHARLES BONAMICO, of 19, New Bridge Street, London, E.C.4, a French Citizen, HAROLD WADE, of 112, Hatton Garden, London, E.C.1, a British Subject, and SPICERS LIMITED, of 19, New Bridge Street, London, E.C.4, a British Company, do hereby declare the nature of this invention to be as follows:—

This invention comprises improvements in or relating to apparatus for applying liquid coatings to surfaces, particularly the surfaces of flexible strip material.

The invention relates especially to coating apparatus, such as that described in Specification No. 321,222, comprising a coating trough of the type having a mouth in the form of a narrow slot-like orifice and a supply conduit arranged to supply coating liquid to the trough in such manner as to form and maintain a meniscus of the coating liquid above the lips of the orifice.

The apparatus according to this invention is designed primarily for applying a coating of collodion to a cellulose acetate film, in order to prepare the latter for the application of a multicolour screen by the method described in Patent No. 322,432. It will be appreciated that it is essential for a very thin layer of collodion of great uniformity to be applied to the film. If the thickness of the collodion layer (which serves as a medium to receive the dyes constituting the colour screen) varies from place to place along the length of the film, it will be understood that the depth of colour of the screen will vary correspondingly, with the result that the film will be unsatisfactory for photographic purposes.

In the case of the apparatus described in Specification No. 321,222 the film is supported near the lips of the orifice on a guide constituted by a roller which is shown as of a comparatively large diameter, and the film as it travels away from the orifice moves in a path inclined at a small angle to the vertical. With this arrangement it is found difficult to

obtain a collodion coating of sufficiently uniform thickness. 50

The present invention provides the improvement in or modification of the apparatus claimed in Patent No. 321,222 which comprises the combination with a coating trough of the type described, of means to traverse the film or other material to be coated across the orifice of the trough in close proximity to but not in contact with the lips thereof, then rapidly upwards for a short distance and finally along a long horizontal path with the coated surface uppermost. 55 60

Owing to the mechanical vibration of the coating machine it is found that there is a tendency for corrugations or ripples to appear in the coating applied to the film. By adopting the arrangement according to this invention this difficulty is avoided by the provision of the long-horizontal path along which the film travels with its coated surface uppermost. During the travel of the film along this path the coating is able to settle to a condition of great uniformity of thickness. After traversing this horizontal path the film is led to a drying chamber, containing a series of festooning rollers or like devices, where the solvent for the coating material is evaporated. 65 70 75 80

According to a feature of the invention, the apparatus may comprise a guide for the film arranged close to but not in contact with the lips of the orifice of the trough, said guide being constituted by a roller of small diameter, for example about one inch. 85

A practical embodiment of the invention will now be described by way of example. The apparatus comprises a coating trough of the kind described in Specification No. 321,222 the trailing lip of the orifice of the trough preferably having the curved form described in that specification and being further from the film than the leading lip. 90 95

The guide for the film comprises a roller, one inch in diameter, supported

[Price 1/-]

Price 4s 6d

just above the orifice and parallel to the length thereof. The film is moved in a substantially horizontal direction across the orifice so as to pick up a thin layer of liquid from the meniscus projecting above its lips. Owing to the small diameter of the guide the film is carried rapidly away from the orifice along a short substantially vertical path, and then turns back on itself and enters a long horizontal path in which its coated surface is uppermost.

This horizontal path is preferably several feet in length. The film then passes around further guide rollers, which contact only with its uncoated surface, and is finally led to a drying chamber containing heated air to complete the evaporation of the solvent.

Dated this 24th day of April, 1931.  
**BOULT, WADE & TENNANT,**  
 111 & 112, Hatton Garden, London, E.C.1,  
 Chartered Patent Agents.

### COMPLETE SPECIFICATION.

#### Improvements in or relating to Apparatus for Applying Liquid Coatings to Surfaces, particularly the Surfaces of Flexible Strip Material.

We, CHARLES BONAMICO, of 19, New Bridge Street, London, E.C.4, a French Citizen, MARION CHALLIS WADE, of 6, Broadlands Road, Highgate, London, N.W.6, and WILLIAM SEAFORD SHARPE, of 12, New Court, Carey Street, London, W.C.2, both British Subjects, and both legal representatives of HAROLD WADE, deceased, late of 112, Hatton Garden, London, E.C.1. and SPICERS LIMITED, of 19, New Bridge Street, London, E.C.4, a British Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention comprises improvements in or relating to apparatus for applying liquid coatings to surfaces, particularly the surfaces of flexible strip material.

The invention relates especially to coating apparatus, such as that described in Specification No. 321,222, comprising a coating trough of the type having a mouth in the form of a narrow slot-like orifice and a supply conduit arranged to supply coating liquid to the trough in such manner as to form and maintain a meniscus of the coating liquid between the lips of the orifice and the material to be coated which is carried by a roller above the trough.

The apparatus according to this invention is designed primarily for applying a coating of collodion to a cellulose acetate film, in order to prepare the latter for the application of a multicolour screen by the method described in Patent No. 322,432. It will be appreciated that it is essential for a very thin layer of collodion of great uniformity to be applied to the film. If the thickness of the collodion layer (which serves as a medium to receive the dyes constituting the colour screen) varies from

place to place along the length of the film, it will be understood that the depth of colour of the screen will vary correspondingly, with the result that the film will be unsatisfactory for photographic purposes.

In the case of the apparatus described in Specification No. 321,222 the film is supported near the lips of the orifice on a guide constituted by a roller which is shown as of a comparatively large diameter, and the film as it travels away from the orifice moves in a path inclined at a small angle to the vertical. With this arrangement it is found difficult to obtain a collodion coating of sufficiently uniform thickness.

The present invention provides the improvement in or modification of the apparatus claimed in Patent No. 321,222 which comprises the combination with a coating trough of the type described, of means to traverse the film or other material to be coated across the orifice of the trough in close proximity to but not in contact with the lips thereof, then immediately upwards for a short distance and finally along a long horizontal path with the coated surface uppermost.

Owing to the mechanical vibration of the coating machine it is found that there is a tendency for corrugations or ripples to appear in the coating applied to the film. By adopting the arrangement according to this invention this difficulty is avoided by the provision of the long-horizontal path along which the film travels with its coated surface uppermost. During the travel of the film along this path the coating is able to settle to a condition of great uniformity of thickness. After traversing this horizontal path the film is led to a drying chamber, containing a series of festooning rollers or like

devices, where the solvent for the coating material is evaporated.

According to a feature of the invention, the apparatus may comprise a guide for the film arranged close to but not in contact with the lips of the orifice of the trough, said guide being constituted by a roller of small diameter, for example about one inch.

10 A practical embodiment of the invention by way of example, will now be described with reference to the drawing. The apparatus comprises a coating trough 1 of the type described in Specification No. 15 321,222, the trailing lip 2 of the orifice of the trough preferably having the curved form described in that specification and being further from the film than the leading lip 3.

20 The film 4, to be coated, is guided in close proximity to but not in contact with the orifice of the trough by means of a guide roller 5 of small diameter (e.g. about 1 inch) supported just above the orifice and 25 parallel to the length thereof. The film 4 is moved in a substantially horizontal direction across the orifice so as to pick up a thin layer of liquid from the meniscus projecting above its lips. Owing to the small 30 diameter of the guide roller 5 the film is carried rapidly away from the orifice along a short upward path as shown at 6 and then turns back on itself and enters a long horizontal path 7 in which its coated surface is uppermost. This horizontal path 35 is preferably several feet in length.

The film then passes over supporting rollers which contact only with its uncoated surface and is finally led to a drying chamber containing heated air to complete the evaporation of the solvent. 40

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:— 45

1. Apparatus for applying liquid coatings to surfaces, particularly the surfaces of flexible strip material which comprises the combination with a coating trough of the type described, of means to traverse the film or other material to be coated across the orifice of the trough in close proximity to but not in contact with the lips thereof, then immediately upwards for a short distance and finally along a long horizontal path with the coated surface uppermost. 50

2. Apparatus as claimed in Claim 1 having a guide for the film arranged close to but not in contact with the lips of the orifice of the trough, said guide being constituted by a roller of small diameter, for example about one inch. 55

3. Apparatus for applying liquid coatings to surfaces substantially as described with reference to the accompanying drawing. 60

Dated this 23rd day of December, 1931.  
BOULT, WADE & TENNANT,  
111 & 112, Hatton Garden, London, E.C.1.,  
Chartered Patent Agents. 65

*[This Drawing is a full-size reproduction of the Original.]*

