To all whom it may concern:

Be it known that I, MAURICE VAN AVERMAETE, a subject of the King of Belgium, and a resident of The Hague, Netherlands, have invented a new and useful Device for Applying Gluten, Coating Material, or the like to a Support-Base or Underlayer, of which the following is a full, clear, and exact description.

My invention relates to an improved device for applying a gluten, coating material or the like to a support and especially to the object of providing a device which can apply the liquid matter evenly to a support which is most sensitive to liquid as e. g. Japan paper, which is easily injured by being wetted.

If paints are applied to a base-layer by means of known devices for instance in applying the base-color to wall papers, the detriment exists, that the paint, being kept quiet in the vessel will precipitate, so that the matter which is applied is not uniform as to its quality and it will be necessary to constantly stir the liquid for preventing that the paint applied to the support is too thin, too thick or too irregular.

To avoid these obstacles the improved device according to the invention consists in a supply receptacle for the gluten or the paint which is adjustable in vertical direction which at its upper face has a narrow slot. Across this slot the support or base-layer to which the matter must be applied is moved and a pump supplies continuously a larger quantity of liquid to the supply receptacle than would be required for coating, only the superfluous liquid being returned to the supply receptacle by a bypass. In more or less closing the latter the liquid pressure at the outlet slot can be controlled in such manner that the liquid is continuously in circulation whereas same is maintained out of contact with the atmosphere during the operation.

Preferably one or more entirely closed tanks are used, in open connection with the lower part of the supply receptacle, and U-shaped tubes are provided, the one end of which opens into the tanks and is slidably stuffed through the upper part of the tank, while the other end is also in the same way connected with the supply receptacle of the pump, such that by adjusting the U-shaped tubes higher or lower, the liquid pressure is exactly controlled.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a diagrammatical side view, partially a section of an apparatus according to the invention.

Fig. 2 is a front view with a partial section of the flexible supply pipe with the pressure controllers.

Fig. 3 is one of the guide-rollers.

Fig. 4 is a horizontal section of the slide-board to which the knife is attached, controlling the thickness of the layer to be applied.

Fig. 5 is an end view of the device controlling the position of the knife.

To the supply receptacle 1, containing the gluten, coating material or the like is connected a tube 2, which extends with one end sufficiently far into the liquid and which with its other end is connected to a stationary pump 3. This pump is by means of a flexible tube 4 coupled to a tube 5, which is attached to a tube 6, from which the liquid is led to the support or base-layer.

At the place where the tubes 5 and 6 meet, slots 7 and 7' are provided in such a way, that above the enlarged mouth of the tube 4 there is in the tube 5 a portion of the connecting wall left, which portion serves as a bufferplate to the liquid leaving the tube 4.

By means of this bufferplate the liquid is caused gradually to spread in lateral direction, by which is obtained that the liquid leaves the tube 6 without shocks through a slot 8 in said tube and is applied to the underlayer or support, avoiding the forming of foam at this outlet opening.

The tube 5, serving as an air chamber and at the same time for removing the superfluous liquid, is at both ends in connection with tubes 21 and 21' which at their outer surface are screw threaded and pass through vertical slots in the side walls 20 and 20' of the box 20 carrying the other parts of the mechanism. This tube 5 is attached to the side walls of the box by the aid of
nuts 28, 28' and 29, 29' respectively at the inner and the outer side of the box and screwed on the tubes 21 and 21'. This arrangement and the flexible connection with the pump permits a simultaneous adjusting of the tubes 5 and 6 by moving them lower or higher, so that the pressure between the tube 6 and the support or base-layer 23 can be regulated. The ends of the tubes 21 and 21' extending through the side walls are connected to overflows-tanks 9 and 9'. These overflow-tanks 9 and 9' communicate with the vessel or receptacle 1 through U-shaped pipes 13 and 13', tanks 10 and 10' and pipes 22 and 22'. The U-shaped connecting pipes 13 and 13' extend to a suitable depth in the overflow-tanks 9 and 9'; these tanks being closed, like the tanks 10 and 10', by lids with stuffing-boxes 11 and 11', through which pass the connecting pipes 13 and 13'. The superfluous liquid, supplied by the pump, flows out of the tube 5 and through the tubes 21, 21' into the overflow-tanks 9, 9' and may return through the U-shaped pipes 13 and 13' and the tanks 10 and 10' and the connection pipes 22 and 22' to the supply receptacle 1. By this is attained that the liquid will circulate continuously in a space, which is nearly entirely out of contact with the atmosphere. Further is obtained that by adjusting the pipes 13 and 13', in the direction of the arrows 14 or 15, the pressure, with which the liquid leaves the outlet-slot 8 of the tube 6 with a predetermined and constant speed, is controllable in a suitable manner. As the overflow tanks 9, 9' are in open communication with the tubes 5, 6 the liquid in the tubes 13, 13' shall have the same height as in the supply receptacle 1. The distance between the slot 8 and the curve of the U-shaped pipes 13-13' determines the counter-pressure of the pump, and therefore the supply-pressure at the slot 8, which distance can be varied by raising or lowering the pipes 13, 13'. The underlayer or support 23, of thin paper or like material, which is to be covered by gluten, paint, or another matter is guided, in the direction of the arrow 24 by three rollers 16, 17 and 18, against and over the slot 8 of the tube 6 and over a knife 19. This knife is arranged between the rollers 17 and 18, while the slot is situated between the rollers 16 and 17. The rollers have fixed bearings. As already described, the tubes 5 and 6 are adjustable by the nuts 28, 28' and 29, 29' and therefore the pressure of the support or base-layer 23 against the slot 8 can be regulated.

With the knife 19 it is possible to control the thickness of the layer on the support, by changing the inclined position of the knife. The matter stricken off from the support falls on the bottom of the box 20, from which it flows back to the supply receptacle 1 through the pipe 26 and passing the sieve 25.

As appears from Fig. 3 the rollers 16, 17 and 18 bear in pins 32, 32' fixed in the side-walls 20 and 20' of the box 20. The pin 32' is movably held in the wall 20' and is actuated by a spring 37 and a perforated cup-shaped piece 36, fixed on the pin 32' which piece is pressed inwardly into a boring of the roller. By drawing back the button 33 against the spring action it is possible to remove the roller for the purpose of cleaning the same.

In order to vary the position of the knife 19, a piece 38 is slidably attached to the side wall 20' of the box, which piece is removable in vertical direction according to the arrows 39 and 40 (Fig. 5).

The angle of inclination of the knife can be changed by means of a handlever 41, movable in the direction of the arrows 42 and 43, while through the pin 44 the perforations 45 this handlever can be fixed in the predetermined position. The knife is adjustable in vertical direction by an eccentric cam 46 and a handlever 47, the latter guided in a slot 49, while the knife can be fixed in the required vertical position by a nut 48.

What I claim is:

1. Device for applying a liquid gluten, paint, covering matter, or the like to an underlayer, a base-layer or support, consisting in a supply-receptacle, a vertically adjustable tube provided at its upper surface with a narrow-slot, across which the support is moved, a pump continuously supplying an excess of liquid to the said receptacle and a bypass whereby the superfluous quantity of liquid is returned to the receptacle, by which at the same time the liquid pressure at the outlet-slot is controllable in such a way that the liquid is entirely out of contact with the atmosphere.

2. An apparatus for applying a coat of liquid gluten or the like to an underlayer, comprising a supply receptacle, a box, a horizontally arranged tube in the box and having a slot in its upper side on which the underlayer bears, a pump to supply an excess of liquid to said tube from said supply receptacle, overflow tanks communicating with said tube, U-shaped pipes leading from the overflow tanks, and tanks into which said U-shaped pipes discharge, said last named tanks being in communication with the supply receptacle and discharging thereinto.

3. An apparatus for applying a coat of liquid gluten or the like to an underlayer, comprising a supply receptacle, a pair of horizontal tubes therein, arranged one above the other and having slots establishing com-
munication therebetween, the upper of said tubes having a slot in its upper side and on which the underlayer bears, a pump to supply an excess of liquid to the lower tube from the supply receptacle, and means to convey excess liquid from the lower tube and to return such excess liquid to the supply receptacle.

In testimony whereof I have signed my name to this specification, in presence of the two subscribing witnesses.

MAURICE VAN AVERMAETE.

Witnesses:
A. C. Gerhard,
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