Nov. 1, 1932. A. MAURER 1,885,747

DRAWING APPARATUS WITH PIVOTALLY MOVABLE LIPS FOR THE MANUFACTURE OF CELLULOSE FILMS OF VARIOUS THICKNESSES

Filed Jan. 7, 1931

Fig. 1.

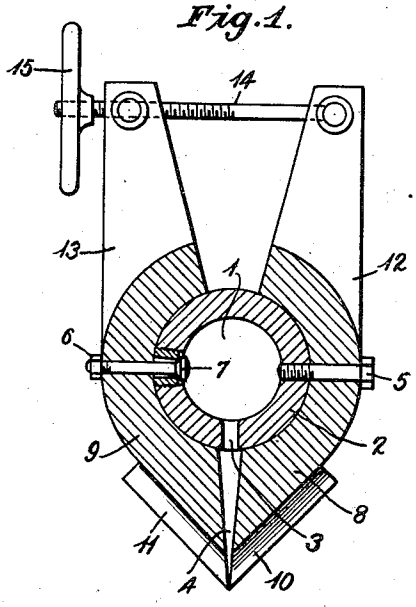


Fig. 2.

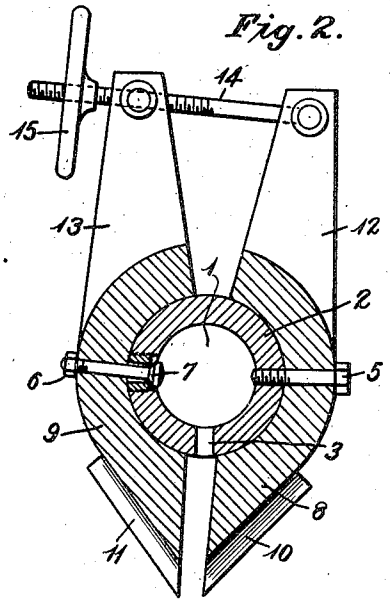


Fig. 3.

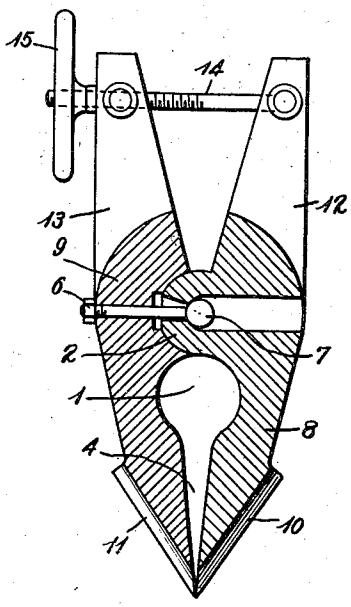
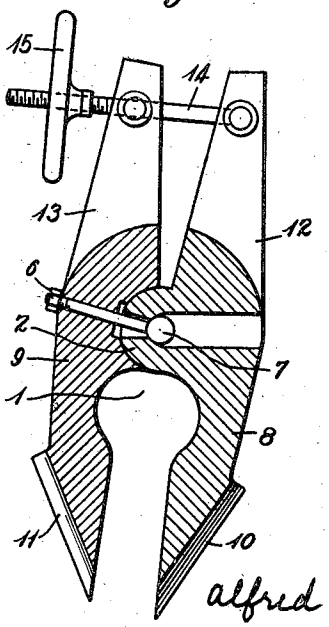


Fig. 4.



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UNITED STATES PATENT OFFICE

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DRAWING APPARATUS WITH PIVOTALLY MOVABLE LIPS FOR THE MANUFACTURE OF CELLULOSE FILMS OF VARIOUS THICKNESSES

Application filed January 7, 1931, Serial No. 507,241, and in France January 27, 1930.

In the ordinary drawing apparatus having a bottom slot for the outlet of the aqueous cellulose solution, the adjustment of the thickness of the slot is effected by means of shutters, that is to say by means of the two lips forming the slot. One lip is movable, and is moved nearer toward or away from the other by means of a set of levers acting on the shutter-like movable lip. The lip is very wide (up to one meter or more) and it will be readily understood that, with such a width, in order to work in a proper manner, the lip should have also a great length.

However, it is not practicable to fix this length at too great a value because the adjustment would become nearly impossible owing to the fact that the shutter is working in acids. Besides, the movable lips forming the slot must be made of inoxidizable metal. Accordingly, there results from the construction and method of adjustment of the present lips used in the manufacture of the cellulose films, a heavy weight, a very delicate adjustment, and a very high cost of the lips.

All these objections are eliminated by the present invention which essentially consists in the fact that the movable lips no longer are shutters and that the adjustment of the slot thickness no longer is effected through a shutter but by causing the stiff wall which carries the lip to pivot about a pipe or a cylindrical pivot, the said pipe or cylindrical pivot at the same time assuring the tightness of the drawing apparatus on the side opposite the slot.

In order to facilitate the description of the principle we shall refer to the accompanying drawing which illustrates, only by way of example and not of limitation, two embodiments of the movable-lip drawing apparatus forming the subject matter of the invention.

Fig. 1 is a cross section showing the drawing apparatus in nearly closed condition.

Fig. 2 is a cross section showing the drawing apparatus in open condition.

Fig. 3 is a cross section showing a modified construction in closed condition.

Fig. 4 is a cross section showing the modified construction according to Fig. 3 in open condition.

The two apparatus according to Figs. 1 and 3 respectively are based on the same thickness-adjustment principle for the slot. They differ only in respect to the duct supplying the solution to be drawn. In the apparatus according to Fig. 1, the liquid is supplied by the tubular cylindrical pivot. In the apparatus according to Fig. 3 the solution is supplied by a preferably circular duct arranged between the cylindrical pivot and the slot.

The following description refers to the construction according to Figs. 1 and 2. The various parts forming the two embodiments are indicated with the same reference numbers when the parts concerned perform the same duty in both constructions.

In Fig. 1 the cellulose solution arrives through the circular bore 1 of the pipe 2 and passes through the holes 3 into the slot 4. The wall 8 is fixed to the cylindrical pivot by studs 5; the bolts 6 secure the wall 9 to the cylindrical pivot. The bolts 6 are fitted with a ball head 7, and the ball center coincides with the center 1 of the cylindrical pivot. On the stationary wall 8 a likewise stationary lip 10 is fixed by means of screws, the said lip being made of acid-proof metal. To the movable wall 9 the second lip 11, likewise of acid-proof metal, is fixed by means of screws. The top end of the wall 8 has one or more extensions 12 cast in one with the piece 8. The movable wall 9 has similar extensions 13.

The two ends of the extensions 12 and 13 are interconnected by an adjustment device operable by means of the handwheel 15. The adjustment of the thickness of the slot 4 is effected through the handwheel 15 and its screw-threaded spindle 14. If the handwheel 15 is revolved in a direction bringing the two ends 12 and 13 nearer to each other, the wall 9 obviously begins to revolve about the cylindrical pivot 2. The wall 8 remains stationary on the cylindrical pivot 2, being prevented from revolving by the studs 5. In this case the thickness of the slot 4 will be increased. If the handwheel 15 is revolved in the op-

posite direction, the thickness of the slot will be decreased.

What has been described above, however, is but an example of embodiment of the subject matter of the invention, and it is obvious that the arrangement of the adjustment through the handwheels 15 and screw-spindles 14 may be varied according to width of the drawing apparatus.

For instance, if the apparatus is very wide, several screw-spindles and handwheels may be provided. In this case, all the handwheels may be interconnected by means of toothed wheels, shafts or worms etc., for the purpose of enabling all the handwheels to be operated simultaneously and from the same place. Further, with the screw-spindle and handwheel adjustment, any convenient quick acting contrivance may be combined for quickly opening the drawing apparatus for cleaning purposes.

Where all the handwheels are interconnected by a common operating device, a movable coupling device might be provided which would permit of disconnecting any of the handwheels along with its spindle and of adjusting it relatively to the other handwheels, and of connecting it up again after completion of the adjustment. The cylindrical pivot 2 (Fig. 1) may be made integral with the wall 8. In such a case the wall 9 would slide directly on the cylindrical pivotal surface of the wall 8. The bolts or studs would then become unnecessary.

The cylindrical pivot might also be designed as shown in Fig. 3. Also the said pivot and the wall 8 might be cast as two separate parts. Finally, the adjusting contrivance need not be arranged in the position shown in Figs. 1 and 3; it may be arranged in any other position according to the size and arrangement of the drawing apparatus in the machine.

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

1. In a drawing apparatus for the manufacture of cellulose films, a cylindrically shaped pipe, two cooperating walls associated with said pipe forming a slot, at least one of said walls being rotatable on said pipe whereby the thickness of said slot may be adjusted.

2. In a drawing apparatus for the manufacture of cellulose films comprising a hollow cylindrical pipe adapted to contain the cellulose material, a plurality of apertures longitudinally disposed in said pipe, two cooperating walls mounted upon said pipe forming a slot in alignment with said apertures, at least one of said walls being rotatable on said pipe whereby the thickness of said slot may be adjusted.

3. In a drawing apparatus for the manufacture of cellulose films comprising a hollow cylindrical pipe adapted to contain the cellulose material, a wall integral with said pipe, a second wall rotatably disposed upon said pipe with respect to said first wall forming a slot at their extremities, a plurality of apertures disposed in said pipe, and a communicating chamber formed in said walls intermediate said apertures and slot.

4. In a drawing apparatus for the manufacture of cellulose films comprising two cooperating walls designed to form a slot, a supply duct for the cellulose material formed in said walls extending to said slot, and means for rotating at least one of said walls with respect to the other for adjusting the thickness of said slot.

5. In the combination claimed in claim 4 wherein said last mentioned means comprises a pivoted joint disposed above the supply duct.

Signed at Bern, Switzerland, this 24th day of December, 1930.

ALFRED MAURER.