

Feb. 16, 1932.

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1,844,972

MACHINE FOR EXTRUDING PLASTICS

Filed Dec. 16, 1930

2 Sheets-Sheet 1

Fig. 1

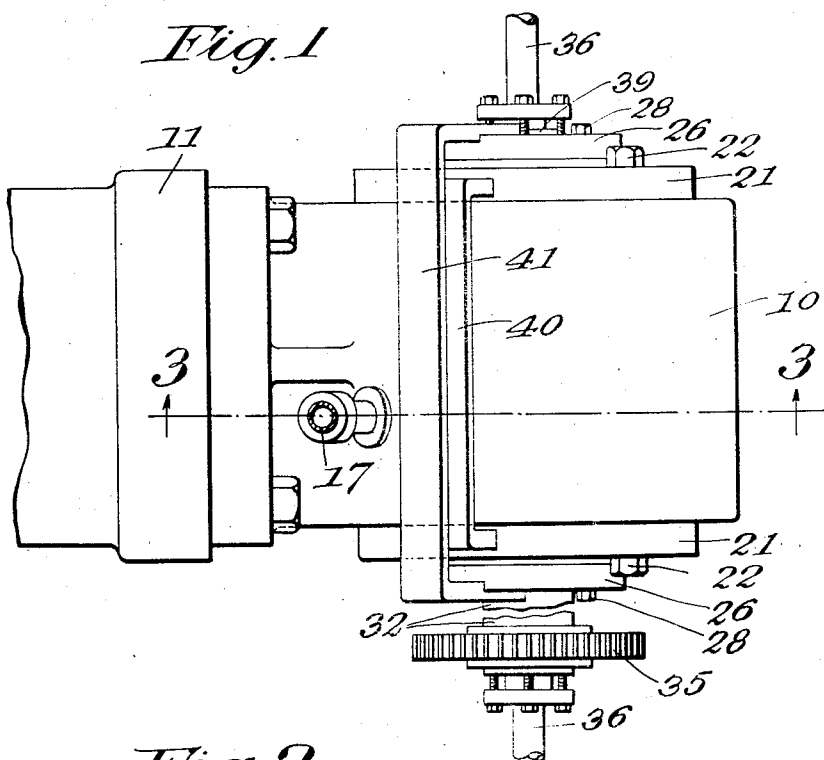
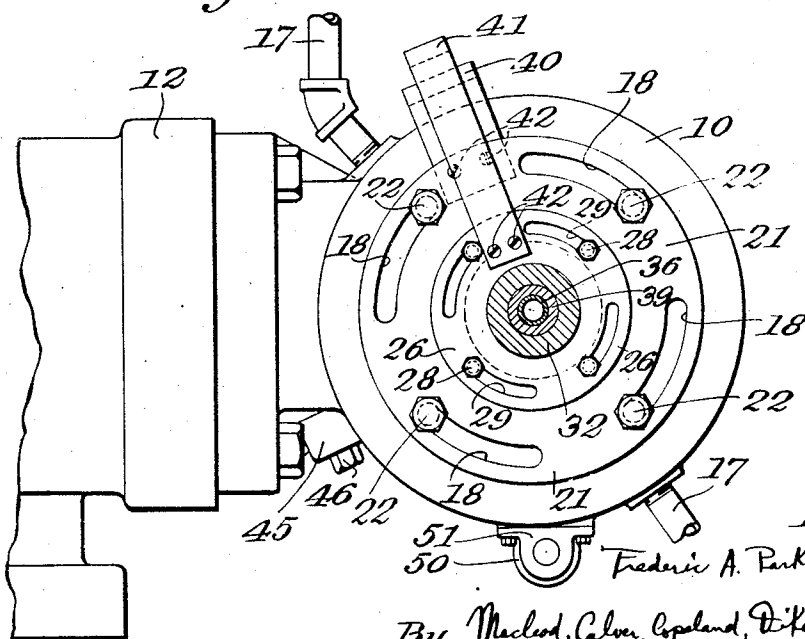


Fig. 2



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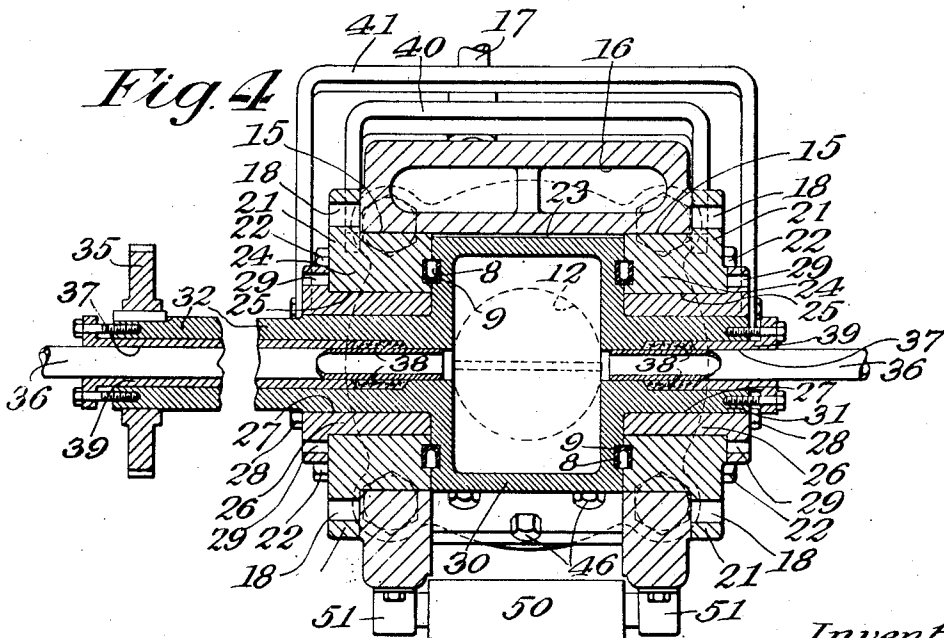
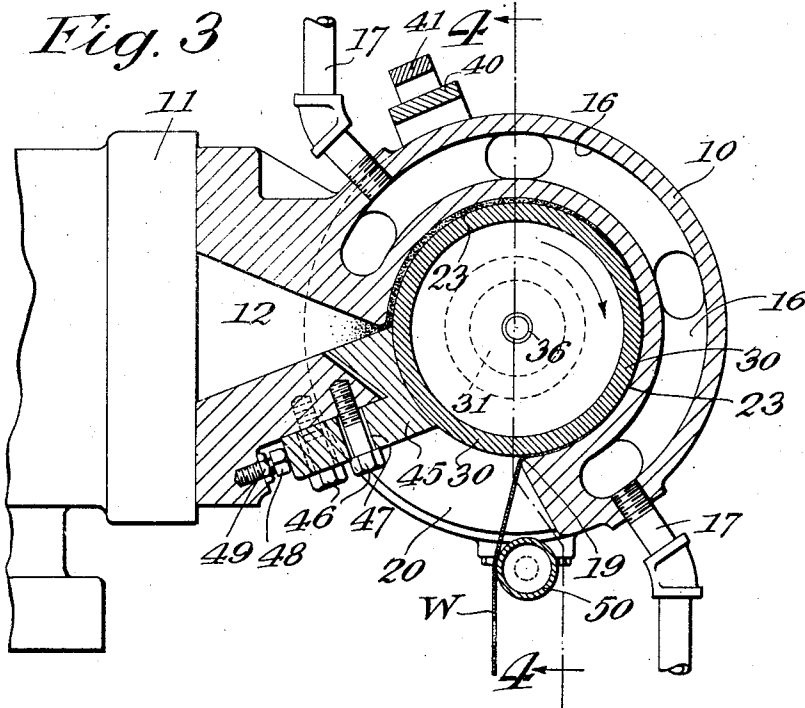
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UNITED STATES PATENT OFFICE

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MACHINE FOR EXTRUDING PLASTICS

Application filed December 16, 1930. Serial No. 502,657.

This invention relates to apparatus for forming a web or sheet from plastic material. The apparatus of the invention is directed particularly to a die through which a mass of pyroxylin in plastic condition may be extruded under heavy pressure to form a thin web of pyroxylin. It has been found by practical experience with apparatus for this purpose that the sheet produced is subject to variations in thickness and frequently contains minute waves which may not be apparent to the eye and do not affect the value of the material for certain uses but which render it unfit for purposes which a sheet of perfect uniformity is required.

It is the object of the present invention to provide an improvement in apparatus of this type adapted to minimize the difficulties experienced with former apparatus and to produce a web or sheet of greater uniformity.

Before explaining in detail the present invention, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practised or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention beyond the terms of the several claims hereto appended as considered in view of the prior art and the requirements thereof.

The invention will be more clearly understood from the following description in conjunction with the accompanying drawings: in which,

Fig. 1 is a top plan view of a die embodying the invention;

Fig. 2 is an elevational view of the same partly in section;

Fig. 3 is a sectional view taken upon the line 3—3 of Fig. 1; and

Fig. 4 is a sectional view taken upon the line 4—4 of Fig. 3.

One embodiment of the invention is shown in the accompanying drawings for the purpose of illustration and comprises a substan-

tially cylindrical casing 10 integral with or otherwise suitably secured to an extrusion press 11 adjacent the nozzle 12 thereof. The casing 10 is provided with a cylindrical bore 15 which is surrounded by a water jacket 55 formed by interconnecting passages 16 between the bore 15 and the outer surface of the casing. Water at a suitable desired temperature is admitted to and discharged from the passages 16 through pipe connections 17. A longitudinal opening 20 is formed in the wall of the casing 10 and communicates with the cylindrical bore 15.

An eccentric flange 21 is suitably secured upon each end of the casing 10 by bolts 22 65 passing through arcuate slots 18 in the flange 21. Each of the eccentric flanges 21 is provided with a cylindrical portion 24 extending inwardly therefrom and having a bearing against the surface of the cylindrical bore 15. A cylindrical opening 25 is eccentrically positioned within each of the cylindrical portions 24 and is adapted to receive a flanged cylindrical bushing 26 having a bearing surface 27 eccentrically positioned 75 therein. The bushings 26 are adjustably secured upon the eccentric flanges 21 by bolts 28 passing through arcuate slots 29 in the flange of the bushing. A cylindrical hollow roll 30 is provided with outwardly extending journals 31 and 32 adapted to be received for rotation in the bearing surfaces 27 of the bushings 26. The outer surface of the roll 30 is spaced from the surface of the cylindrical bore 15 to provide an orifice 23 there- 85 between extending from the nozzle 12 and terminating in the opening 20. An annular packing 8, preferably of U-shaped cross-section, may be disposed between the abutting surfaces of the roll 30 and the eccentric 90 flanges 21 and extend into cooperating annular grooves 9 therein.

The roll 30 may be rotated through suitable driving connections including a gear 35 secured upon the journal 32. Water at any 95 suitable desired temperature may be admitted to and discharged from the interior of the roll 30 through suitable pipe connections 36 positioned in the axial bores 37 in the journals 31 and 32. Leakage is prevented by 100

suitable packing 38 surrounding the pipe connections 36 and held in place by a stuffing box 39. Bails 40 and 41 are suitably secured at their ends to the eccentric flanges 21 and bushings 26 respectively as by screws 42.

A closure member 45 extends into the opening 20 toward the roll 30 and is adjustably mounted upon the end of the bottom wall of the nozzle 12 as by bolts 46 passing through slots 47 in the member 45. If desired, an adjustable stop screw 48 may be secured in the bottom wall of the nozzle 12 so as to abut the end of the member 45 and may be locked in adjusted position as by a lock nut 49. A guide roll 50 is mounted for rotation in suitable bearings 51 upon the casing 10 adjacent the edge of the opening 20.

In operation, power is supplied to rotate the roll 30 in the direction of the arrow in Fig. 3 and plastic material, such as celluloid in plastic condition, is forced under pressure through the nozzle 12 of the extrusion press 11 into the orifice 23 to form a web W. The rotation of the roll 30 assists in moving the web of plastic material through the orifice 23 and at the same time exerts an ironing action upon the web tending to smooth and polish its surface. The web W is discharged from the orifice 23 over the rounded surface 19 through the opening 20 and upon the rotatable guide roll 50 whence it passes to suitable drying and curing apparatus (not shown). The web W is maintained in a suitable plastic condition during its passage through the orifice by circulation of water at a suitable temperature through the passages 16 in the casing 10 and within the interior of the hollow roll 30.

The position of the roll 30 within the bore 15 may be adjusted so that the orifice 23 gradually decreases in depth from its end communicating with the nozzle 12 towards its end communicating with the opening 20 by releasing the bolts 22 and 28 and turning the eccentric flange 21 and eccentric bushings 26 by means of the bails 40 and 41 respectively. The final thickness of the web produced is determined by the depth of the orifice 23 at its discharge end. When it is desired to change the thickness of the web by adjusting the position of the roll 30, the position of the member 45 is changed to bring its curved end, which corresponds to the curvature of the roll, adjacent the surface of the roll. The rotation of the roll causes the plastic material to move into the orifice 23 rather than past the member 45.

I claim:

1. In an apparatus for forming a web from plastic material, a die comprising a hollow stationary casing having a curved inner surface, a member mounted for movement adjacent said surface, and means for moving said member to cause its surface to move relative to the curved inner surface of said cas-

ing in a path having a predetermined spaced relation thereto.

2. In an apparatus for forming a web from plastic material, a die comprising a stationary hollow casing having a cylindrical inner surface and an opening, and a roll mounted for rotation within the casing with its surface spaced from the inner surface of the casing to provide an orifice therebetween communicating with said opening.

3. In an apparatus for forming a web from plastic material, a die comprising a stationary, hollow casing having a cylindrical inner surface and an opening, a roll mounted for rotation within the casing with its surface spaced from the inner surface of the casing to provide an orifice therebetween communicating with said opening, and means for adjusting the position of said roll with respect to said surface.

4. In an apparatus for forming a web from plastic material, a die comprising a stationary hollow casing having a cylindrical inner surface and an opening, a roll mounted for rotation within the casing with its surface spaced from the inner surface of the casing to provide an orifice therebetween communicating with said opening, and a guide roll mounted for rotation upon said casing adjacent said opening.

5. In an apparatus for forming a web from plastic material, a die comprising a stationary hollow casting having a cylindrical inner surface and an opening, a roll mounted for rotation within the casing and eccentrically positioned with respect to said cylindrical surface to provide an orifice therebetween of gradually decreasing depth as it approaches said opening.

6. In an apparatus for forming a web from plastic material, a die comprising a hollow stationary casing having a cylindrical bore and a longitudinal opening, an eccentric bushing adjustably supported in each end of said bore, and a roll rotatably supported in said bushing with its surface spaced from the surface of said bore to provide an orifice therebetween communicating with said opening.

7. In an apparatus for forming a web from plastic material, a die comprising a hollow stationary casing having a cylindrical bore and a longitudinal opening, an eccentric flange adjustably supported in each end of said bore, a bushing carried by said flange, and a roll rotatably supported in said bushing with its surface spaced from the surface of said bore to provide an orifice therebetween communicating with said opening.

8. In an apparatus for forming a web from plastic material, a die comprising a stationary hollow casing having a cylindrical bore and a longitudinal opening, a flange adjustably mounted upon the ends of said casing having an opening therein eccentrically po-

sitioned with respect to said bore, a bushing adjustably mounted in said opening having a bearing surface eccentrically positioned with respect to said opening, and a roll rotatably supported in said bearing surface with its surface spaced from said bore to provide an orifice therebetween communicating with said longitudinal opening.

9. In an apparatus for forming a web from plastic material, a die comprising a hollow stationary casing having a cylindrical inner surface and a longitudinal opening, a roll mounted for rotation within the casing with its surface spaced from the inner surface of the casing to provide an orifice therebetween communicating at its ends with said opening, means for adjusting the position of said roll with respect to the inner surface of said casing, and means providing a passage connecting one end of said orifice including an adjustable member extending into said opening toward said roll.

10. In an apparatus for forming a web from plastic material, a die comprising a hollow stationary casing having a cylindrical bore and a longitudinal opening, a flange adjustably carried upon each end of said casing and provided with a cylindrical portion engaging said bore and having a cylindrical opening eccentrically positioned therein, a bushing adjustably carried by said flange provided with a cylindrical portion engaging said opening and having a bearing surface eccentrically positioned therein, and a roll rotatably supported in said bearing surface with its surface spaced from said bore to provide an orifice therebetween communicating with said longitudinal opening.

In testimony whereof I affix my signature.

FREDERIC A. PARKHURST.

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