

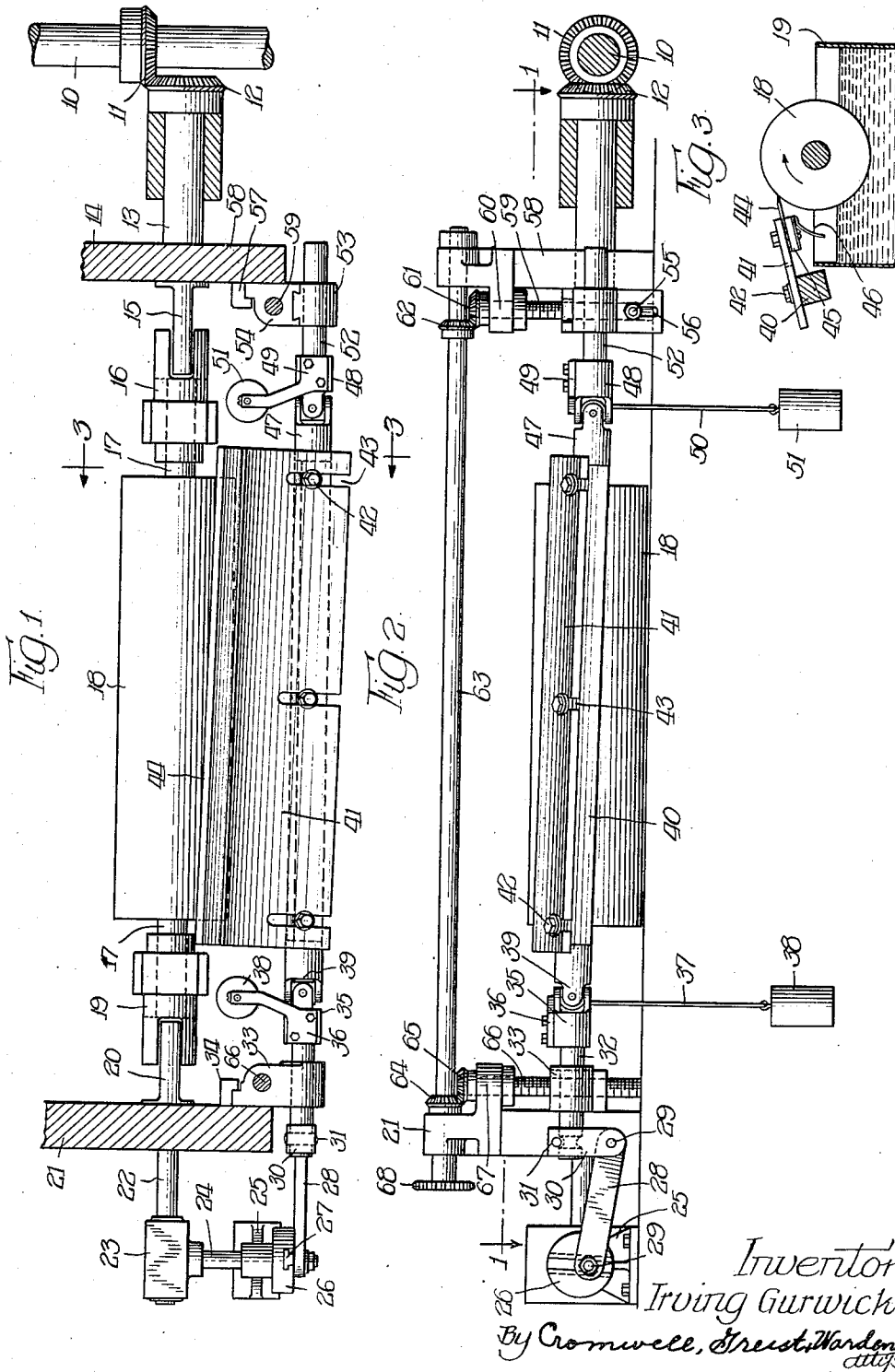
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INTAGLIO PRINTING DEVICE

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INTAGLIO PRINTING DEVICE

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The present invention relates to printing mechanisms and has particular reference to an improved doctor device for use in connection with etched printing cylinders of the intaglio type.

5 A principal object of the invention is the provision of an improved doctor for wiping excess ink from an intaglio printing cylinder.

10 An additional object is the provision of an intaglio printing unit having an etched cylinder provided with etched portions substantially parallel to the face of the cylinder and a doctor mechanism for wiping the cylinder at a non-axial angle.

15 Still another object is the provision of an intaglio printing unit which may be operated with a reduced tendency for wear on the etched design.

20 These and other objects will be evident upon a consideration of the following description and by reference to the accompanying drawing, in which

25 Fig. 1 is a top view partly in section taken along line i—i of Fig. 2 of an intaglio printing unit constructed in accordance with my invention, the unit being shown as isolated from an intaglio printing machine;

Fig. 2 is a side view of the device shown in Fig. 1; and

30 Fig. 3 is an end sectional view taken along line 3—3 of Fig. 1.

Intaglio printing devices have been used for many years for the printing of various materials. In particular, devices of this character have been found to be of great utility in the printing 35 of transparent cellulose sheeting such as the product known as "Cellophane." In my Patent No. 2,024,354, issued December 17, 1935, is described an intaglio printing machine which is highly successful in printing materials of the 40 type described. The unit shown in the drawing may be employed in the machine of this patent or in other suitable intaglio structure. Only so much of the printing device as is necessary for an understanding of the invention has been described.

45 In the drawing, the intaglio printing unit includes a main drive shaft indicated at 10 having a gear 11 mounted thereon. This gear meshes with and drives a gear 12 which is rigidly attached to shaft 13 extending transversely of the unit. Shaft 13 is rotatably mounted in a frame structure 14 and has an inwardly extending flange portion 15 which is engaged by the 50 jaws 16. The jaws 16 are attached to shaft 17 of a printing cylinder 18, shaft 17 also extend-

ing on the opposite side of the cylinder. Shaft 17 customarily is journaled in the sides of a color bath 19 shown in Fig. 3. The jaws 69 on the opposite side of the printing cylinder from the jaws 16 engage and drive a flange 20 which 5 is journaled in the frame structure 21 and united to an outwardly extending shaft 22.

Shaft 22 rotates at reduced speed, by means of a suitable worm drive indicated generally at 23, a shaft 24 which extends parallel to the 10 frame 21. The intermediate portion of shaft 24 is journaled in a frame unit 25, as shown in Fig. 1. To the opposite end of shaft 24 is mounted a crank disk 26 having a diametrically extending T-slot 27. A lever 28 has an end portion 15 secured at a suitable point in the T-slot 27 by means of the nut 29. The opposite end of lever 28 is pivotally mounted at 29 between the jaws of a yoke 30 which is rigidly mounted by means of a suitable pin connection shown at 31 20 to a shaft 32. Shaft 32 is received by a frame unit 33 which is mounted in vertically adjustable relation with the frame unit 21 by means of the frame extension 34.

The inner end of shaft 32 carries one section 25 35 of a universal joint. Upon section 35 is clamped a horizontally extending arm 36 to which is attached a downwardly depending rod 37 bearing weight 38. The other section 39 of the universal joint is attached to a doctor blade carrying arm 40. A plate 41 is adjustably secured to arm 40 by means of the set screws 42 and slots 43. The doctor blade 44 is clamped between plate 41 and a lower plate 45 and bears against cylinder 18 in the manner shown in Fig. 3. It is 30 desirable to employ a baffle 46 beneath the lower portion of plate 45 in order to prevent splashing of ink from the rotating cylinder 18.

The rod 40 carries on the end opposite to the member 39 a corresponding section 47 of a uni- 40 versal joint. This section is attached to a complementary section 48 in the usual manner of universal joints. Section 40 carries a horizontally extending plate 49 to which is attached a downwardly depending rod 50 carrying weight 51. 45 Section 48 is attached to a shaft 52 which is journaled in frame unit 53. The frame unit 53 is carried by a frame unit 54 and is adjustable vertically therein. This adjustment is effected by loosening the set screw 55 and positioning the 50 slot 56 properly to any desired position. The set screw then is tightened and a rigid position is assured.

In addition to the vertical adjustment afforded by slot 56 and set screw 55 both ends of the doc- 55

tor mechanism are vertically adjustable. The frame unit 54 is mounted to slide in a vertical manner along the channel member 57 which is attached to the main frame unit 14. A vertically extending screw 59 is rotatably mounted in a collar 60 of the frame unit and carries an upper gear 61. The lower end of the screw is threaded into frame unit 54 and upon rotation of the screw the frame unit and the doctor mechanism are altered in their vertical position. Meshing with gear 61 is a gear 62 which is carried on shaft 63 extending transversely of the machine. One end of shaft 63 is journaled in frame 14, as shown in Fig. 2 and the other end of the shaft is journaled in frame unit 21. Adjacent frame unit 21 shaft 63 carries a gear 64 which meshes with a gear 65 mounted on shaft 66, the latter being rotatably mounted in an extension 67 of frame unit 21 and having its lower end threaded into the frame unit 33. A hand wheel 68 is attached to the end of shaft 63. It will be seen that by rotation of the hand wheel 68 the entire doctor mechanism is raised or lowered as a unit.

In the operation of the device the etched cylinder 18 is driven as indicated by the arrow in Fig. 3 and the doctor blade 44 wipes ink from the unetched portions thereof, the weights 38 and 51 providing the necessary pressure for this purpose.

The doctor mechanism is mounted in such a manner that the doctor blade is presented to the printing cylinder 18 along the line which is not parallel to the axis of rotation of the cylinder. That is, as will be seen from Figs. 1 and 2, the doctor blade is set at a non-perpendicular angle to the direction of rotation of the printing cylinder. I have found that this type of wiping effect results in the production of an improved printing design and that there is less of a tendency for the blade to damage the etched portions of the cylinder, particularly the portions which include horizontal lines. In following the contour of the cylinder, the blade is slightly curved. The position of the blade prevents the blade from digging into the etched design. Where the blade has the effect of digging into the etched lines, there is a deficiency of ink in one part of the line and a tendency for this line to be printed light along one edge. Also, the angular positioning of the doctor blade prevents the blade from bouncing

against the following side of etched lines of the type described.

The worm gearing indicated generally at 23 provides for a slow rotation of shaft 24 which drives the crank disk 26. As the crank disk rotates, the arm 28 causes the yoke 30 to be moved transversely of the machine, thereby imparting transverse motion to the entire doctor mechanism. Shaft 52 merely slides in the frame unit 53 and as the motion of this shaft and the shaft 32 are horizontal, the angular mounting of arm 40 necessitates action of the universal joints during the reciprocal movement.

The angular position of the doctor blade is provided by setting the frame unit 54 at a different level from the level of frame unit 33, as will be seen in Fig. 2. The doctor blade carrying plate 41 then is positioned so as to present the doctor blade 44 continuously along the cylinder 18 as described. Once the proper arrangement is provided, the entire unit may be raised and lowered by the operation of the hand wheels 68 without disturbing the relative position of shafts 52 and 32.

As before stated, the intaglio unit described is suitable for use in connection with any intaglio printing device. Such devices include the usual standard equipment, such as impression cylinders and means for drawing a web through the machine between the impression cylinder and the printing cylinder 18. Customarily, a plurality of color units are included in a single machine.

The mechanism described obviously is susceptible to changes without departing from the scope of the invention and all such changes are intended to be included in the appended claims.

I claim:

1. An etched cylinder, a doctor blade mounted adjacent said cylinder in angular relation with respect thereto, a carrier for said doctor blade, universal joints on the ends of said carrier, horizontal shafts connected to said universal joints in different vertical positions, and means for transversely reciprocating said shafts.

2. In a device of the type described, a printing cylinder, a doctor blade mounted adjacent said cylinder in angular relation with respect thereto, universal joints mounted adjacent the ends of said blade, offset shaft members mounted on said universal joints, and means for moving said shaft members back and forth.

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