

July 20, 1954

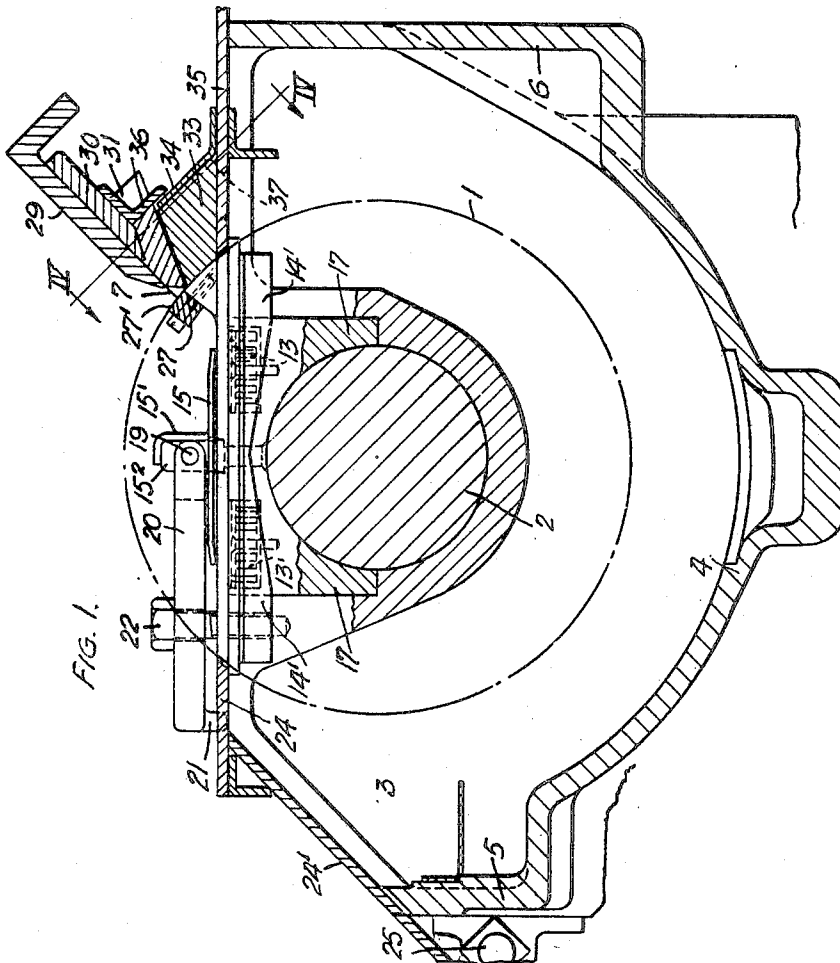
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CYLINDER HOUSING MEANS FOR INTAGLIO PRINTING MACHINES

Filed Nov. 10, 1948

4 Sheets-Sheet 1



INVENTOR
Norman P. Toft
by Albert J. Horton
ATTORNEY.

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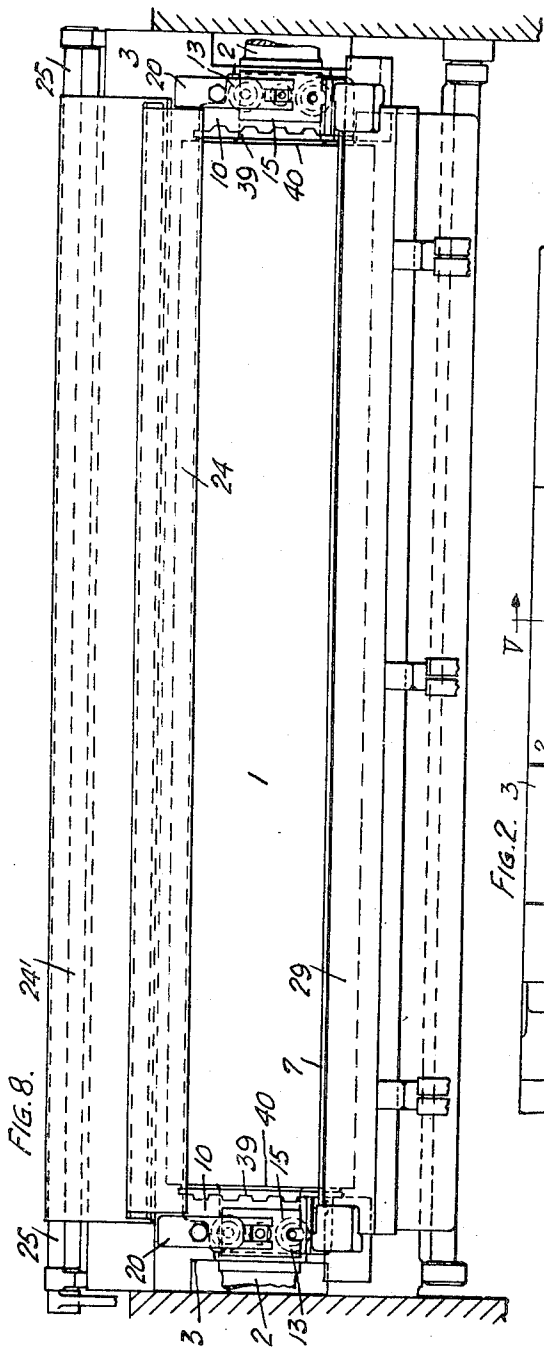
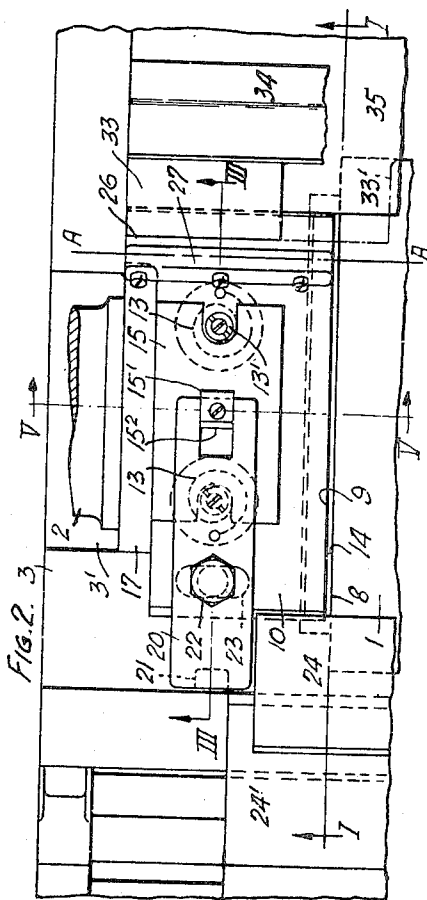
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4 Sheets-Sheet 2



INVENTOR
Norman P. Toft
by Albert J. Horton
ATTORNEY.

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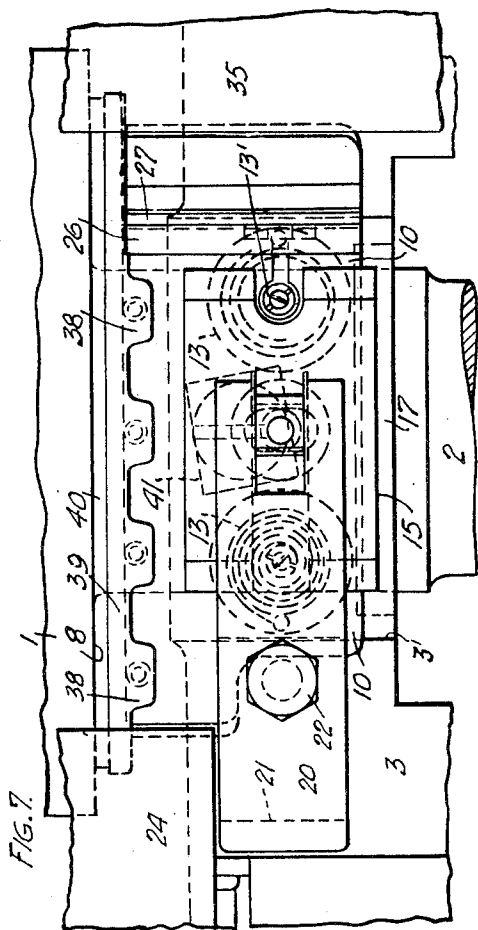
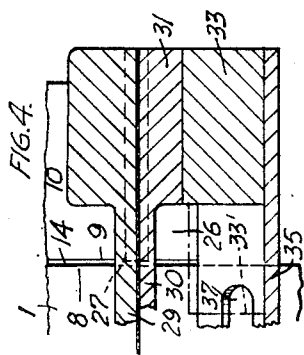
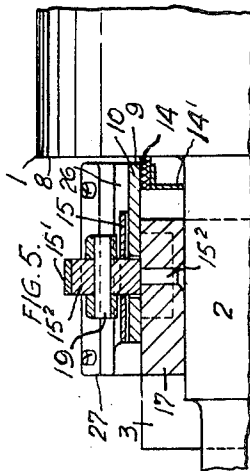
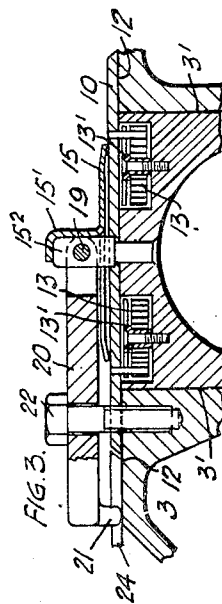
N. P. TOFT

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CYLINDER HOUSING MEANS FOR INTAGLIO PRINTING MACHINES

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4 Sheets-Sheet 3



INVENTOR
Norman P. Toft
by Albert Horton
ATTORNEY

July 20, 1954

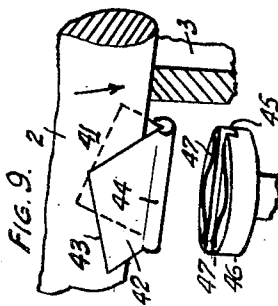
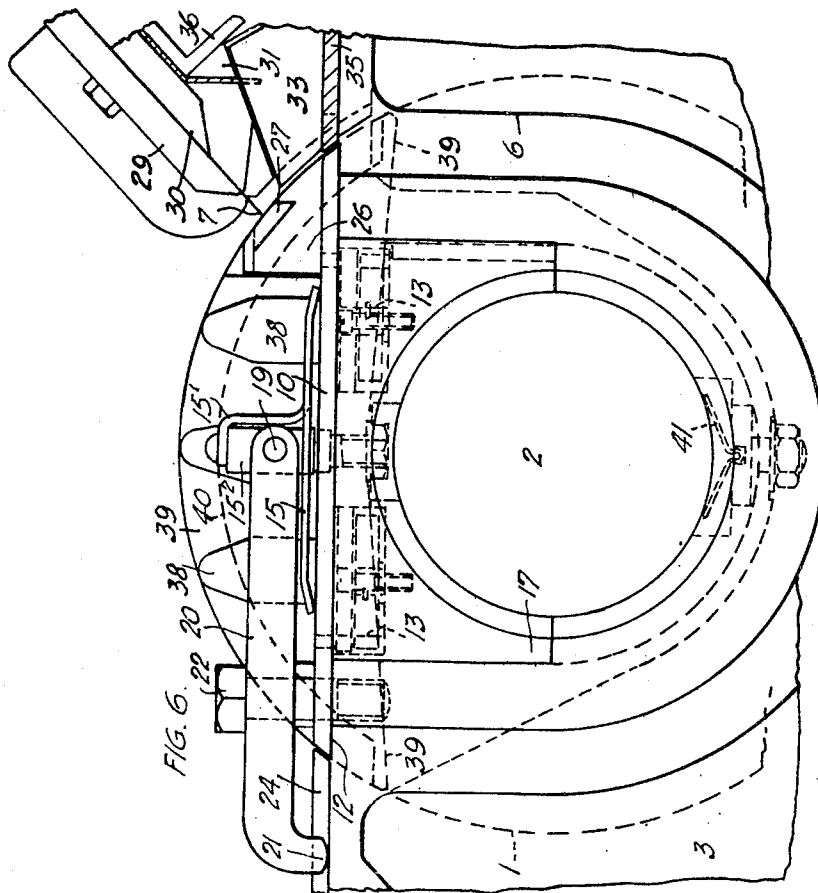
N. P. TOFT

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CYLINDER HOUSING MEANS FOR INTAGLIO PRINTING MACHINES

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4 Sheets-Sheet 4



INVENTOR
Norman P. Toft
by Albert Horton
ATTORNEY

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CYLINDER HOUSING MEANS FOR INTAGLIO
PRINTING MACHINESNorman Peter Toft, London, England, assignor
to R. Hoe & Co. Inc., New York, N. Y., a cor-
poration of New York

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7 Claims. (Cl. 101—157)

1

This invention relates to intaglio printing machines adapted to employ inks of a highly volatile nature to facilitate the production of printed products at high speeds: the invention is concerned with printing machines the printing cylinder of which is axially adjustable with respect to an ink housing so as to permit of "side-lay" adjustment, and the invention is concerned with sealing the spaces between the ends of the cylinder and the end walls of the housing by sealing members which are in abutting engagement with the ends of the cylinder.

Now the present invention has for its main purposes to provide a simple arrangement.

This object is achieved by forming the sealing or closure members by flat plates having plane faces which are in sliding and sealing engagement with plane faces on the end walls of the ink-housing, and these plates are individually spring urged in the axial direction of the cylinder to hold either their edges or flanged extensions thereof in abutting closing engagement with the end faces of the cylinder.

The invention is illustrated in the accompanying drawings in which Figure 1 is a sectional elevation on the line I—I Figure 2, Figure 2 a plan view, Figure 3 a section on the line III—III Figure 2, Figure 4 a section on the line IV—IV Figure 1 and Figure 5 a section on the line V—V Figure 2. Figure 6 is an end elevation Figure 7 a plan of a modified construction and Figure 8 a plan view to a smaller scale of a complete housing incorporating the construction shown in Figures 6 and 7. Figure 9 is a detail perspective view.

Referring to the drawings, 1 indicates the printing cylinder of an intaglio printing machine, this cylinder having shaft ends 2 which are rotatably mounted in bearings carried by the side frames of the machine, the shaft ends being accommodated in recesses 3' in the end walls 3 of a stationary ink housing having also a base 4 and side walls 5, 6, the housing being supplied with ink to a level such that the periphery of the printing cylinder 1 passes through the ink in its rotation. The inked periphery of the cylinder 1 passes below a reciprocating doctor blade 7 the line of reciprocation of the edge of which is indicated at A—A in Figure 2 and which removes the ink from the peripheral surface of the cylinder leaving ink in the etching all this being as is customary in intaglio printing machines.

In a printing operation, it is necessary to be able to adjust the cylinder 1 axially or as it is commonly termed to effect "side-lay" adjustment and for this purpose it is common to associate one

2

or other shaft end 2 with a device by the operation of which the cylinder 1 can be moved axially while it is rotating, such mechanism being well known it is not necessary for an understanding of the present invention to describe it further.

This invention is concerned with the closing of the spaces between the cylinder 1 and the side and end walls of the ink housing so that a volatile ink can be used without the danger which would arise if the ink or its vapours could escape to any substantial extent from the fountain into the press room. The invention is especially concerned with the closing of the spaces between the ends 8 of the cylinder 1 and the end walls 3 of the housing while at the same time enabling the cylinder 1 to be adjusted axially.

To effect the closing of the ends of the cylinder the arrangement shown in the drawings is employed. It is to be observed that the drawings illustrate the arrangement at only one end of the cylinder 1, a similar arrangement being employed at the other end. Considering firstly the arrangement shown in Figures 1-5 the end of the cylinder is engaged by a strip 14 disposed at the edge 9 of a flat sealing plate 10 the flat under-surface of which is slidable on the upper edge 12 of the end wall 3 of the housing, in addition the plate is spring urged into engagement with the cylinder end 8 by springs 13 which enable the plates to accommodate themselves to axial side-lay adjustment movement of the cylinder 1. As will be clear from Figure 1, the plate 10 is of such length and disposition as to engage the cylinder end 8 along a horizontal chord above the axis of rotation and above the shaft end 2.

The strip 14 is of material such as felt or carbon which is well adapted to withstand the wearing engagement with the rotating cylinder end, the strip being readily renewable. The strip is secured by a clamp bar 14' which can be shaped as seen in Figure 1 to promote the drainage of ink away from the shaft end 2.

The plate 10 is lightly held down in sealing sliding engagement with the plane surface 12 at the ends of the housing by a pressure pad 15 formed by a cambered metal strip the shape affording a degree of resiliency to the strips. The recess 3' for the shaft end 2 is closed below the plate 10 by a cover block 17 which is removable to enable the cylinder 1 to be removed from the housing. It is observed that for the purpose of closing the ends of the housing, the removable block 17 can be regarded as part of the housing and wall 3, the upper face of each block being formed with a flat surface which in effect forms

a continuation of the upper edge 12 of the end wall of the housing to enable the plate 10 to slide on them while maintaining a closure.

The pressure pad 15 is flanged at 15' and secured by the flange to a pin 15² on the block 17 which is pivotally supported at 19 from the end of an arm 20 the other end of which has a beak 21 bearing on the plane face 12 of the end of the housing beyond the engagement of that face by the plate 10. Between its ends the arm 20 has a hold-down bolt 22 passing through it, the bolt passing also through a clearance slot 23 in the plate to enable the plate to slide when the cylinder side-lay adjustment is made.

In the construction shown the springs 13 urging the plates 10 into sealing co-operation with the cylinder ends 3 are of the clock spring or spiral type the springs being housed in recesses in the blocks 17 and being adjustable by sleeves 13' access to which is afforded by slots in the pads 15.

Each sealing plate 10 terminates (as seen from the ends of the cylinders) at the periphery of the cylinder 1, i. e. the plates represent exact chords to the cylinder, and along the side wall of the housing remote from the doctor blade is fitted a cover plate 24 which extends from the side wall 5 almost into contact with the curved periphery of the cylinder 1 and hence also almost into contact with the edges of the sealing plates 10 so completing the closure at that side of the housing. The plate 24 is carried by a plate 24' on a pivot of which a part is indicated at 25 which enables the plates to be swung out to expose the interior of the housing and the plate 24 can be adjustable on the plate 24' to set it to the periphery of the cylinder.

The plate 10 is provided with a wing piece 26 which carries a replaceable wearing block 27 having with the wing piece an outer surface 27' which is curved to the curvature of the periphery of the cylinder 1 and the end of the doctor blade 7 sliding as it is reciprocated along the peripheral surface of the cylinder 1 over the surfaces 27'. These blocks extend almost up to the cylinder ends 3.

The doctor blade 7 is strained or clamped between upper and lower bars 29, 30, and the bar 30 is flanged at its end at 31. The flange 31 is slidable (in reciprocation of the doctor blade) upon a stationary end closure block 33 which fits snugly to the surfaces 27' of the wing 26 to complete therewith and with the block 33 the closing of the spaces at the ends of the doctor blade 7. The blocks 33 can terminate short of the end faces of the cylinder 1 by an amount equal to the amount of side-lay adjustment thereof as is indicated in Figures 2 and 5 in full lines or they can be extended to over the end parts of the cylinder as indicated by the dotted lines 33'.

The longitudinal closure (i. e. along the length of the housing) on the doctor blade side and the end closures effected by the block 33 at each end is achieved by fitting between those blocks a closure plate 34 secured to a longitudinal cover plate 35 fitted to the top of the side wall 6 of the housing, and the doctor-blade bar 30 is fitted with a down-turned flange 36 which rides with a very small clearance over this closure plate 34. The cover plate 35 extends closely to the periphery of the cylinder 1 and so may exercise a preliminary wiping effect on the ink on the surface of the cylinder and this plate is formed with openings 37 to enable ink which is removed by the action of the doctor blade 7 to pass back into

the housing. The plate 35 and with it the two end blocks 33 are pivotally supported by a pivot not shown to enable the assemblage to be swung to expose the fountain.

At the present time it is the usual practice to constitute the printing surface of the cylinder 1 by a thin skin which covers not only the peripheral surface of the cylinder but also wraps over the cylinder end walls and extends down towards but not to the shaft.

The arrangement shown in Figures 1-5 is entirely satisfactory for a certain range of cylinder diameter, the edge of the flat plates 10 or as shown of the strips 14 being capable of being positioned to engage over the whole of its extent the wrapped-over part of the skin.

In the smaller range of diameter however, it might be difficult to ensure this result with a straight-edge surface and in such cases the arrangement shown in Figures 6 and 7 can be used. In this case, the plates 10 are formed with flanges 39 are stiffened by ribs 38 and which carry an arc-shaped piece 40 of material such as felt which by reason of the flange construction can engage the end 8 of the cylinder 1 on an arc which extends wholly over the wrapped over part of the skin.

It is preferred to carry the flange 39 below the plane of the part 10 as is shown in Figure 6.

In order to minimise the travel of ink from the housing along the shaft ends 2 of the cylinder 1, each shaft end is engaged by a rectangular metal plate 41 which is pressed-out to a V-form the hollow base of the V being presented to the under surface of the shaft end as is indicated most clearly in Figure 9 in which is indicated by the arrow, the direction of rotation of the shaft end 2 which extends through the end 3 of the housing. The leading limb 42 of the V forms the chief operative portion of the plate and the outer edge 43 of this limb is formed at an angle to the axis of the shaft so that the edge slopes downwardly away from the end wall 3.

This outer edge which is opposed to the rotation of the shaft acts as a scraper which scrapes ink from the shaft ends as it rotates and, due to the sloping form of this edge, the ink so scraped runs downwardly away from the end wall and so back into the fountain. It will be seen that the trailing limb of the plate 41 similarly acts to deflect inward and away from the end wall, any ink that may get under it.

To provide an edge 43 at the required angle, a rectangular plate can be pressed-out to form a V about the centre line of the V and the plate then set with its apex 44 at an angle to the axis of the shaft. However as shown it is preferred to press out the V with its apex at an angle for this automatically produces the required slope at its edge 42.

The apex of the V is rounded and fits into a groove 45 in a supporting block 46 secured to the base wall of the housing so that the plate can rock to adapt itself to the shaft end 3, springs 47 being provided to clip the plate in position.

The arrangement shown in these Figures 6 and 7 otherwise follows the construction shown in Figures 1-5 the parts which correspond to one another having similar reference numerals.

What I claim is:

1. In combination a housing to contain ink, a printing cylinder rotatable in the housing and having a shaft extending through a wall of the housing, and a V-shaped scraper supported intermediate its end in a fixed position under the

5

shaft to minimise the passage of ink along the shaft towards the housing, the said scraper having a scraping edge which engages the surface of the shaft in opposition to the direction of rotation of the shaft and which extends with a slope downwards away from the housing wall.

2. In a printing machine having a housing for ink, and a cylinder having a shaft rotatable in a bearing in a wall of the housing, a scraper device for deflecting ink reaching the shaft away from the bearing and comprising a rectangular plate of flexible material having ends cut substantially square with its side edges, and bent at a mid portion along a line out of parallelism with the ends, and a scraper support positioned in the housing under the shaft and having a slot adapted to receive and hold the plate at its bent portion and press its ends against the shaft.

3. In an ink cylinder housing for an intaglio printing machine having a shaft rotatably supporting a printing cylinder and extending through the housing, means to substantially prevent the escape of ink from the housing, including a V-shaped scraper supported intermediate its ends in a fixed position under the said shaft to minimize the passage of ink along the shaft toward a wall of the housing, the said scraper having a scraping edge which engages the surface of the shaft and extends downwardly away from the housing wall.

4. In an ink cylinder housing for an intaglio printing machine having a shaft rotatably supporting a printing cylinder and extending through the housing, means to substantially prevent the escape of ink from the housing including a scraper comprising a plate bent into a V form and fixedly supported under the shaft so opposite edges of the plate are presented to the surface of the shaft and one of said edges extends at an angle downwardly away from a housing wall.

5. An intaglio printing machine comprising in combination an ink housing having side walls and end walls, the upper part of each wall having a generally horizontal plane face, a printing cylinder having a shaft and being rotatable and axially adjustable in the housing, and means to close the spaces between the end surfaces of the cylinder and the end walls, the said means including a pair of relatively small and light weight end closure members each comprising a flat plate having an under-side plane face for co-planar slidable engagement with the said plane face on an end wall, the said plate extending inward toward the end of the cylinder and having a renewable wearing strip positioned to sealingly engage the adjacent end of the cylinder along a horizontal chord above the cylinder shaft, and spring means to hold the said end closure members in engagement with the said plane faces on the end walls and against the ends of the cylinder.

6

6. An intaglio printing machine comprising in combination an ink housing having side walls and end walls, the top of each wall having a horizontal flat surface, a printing cylinder rotatable and axially adjustable in the housing, and means to close the spaces between the end surfaces of the cylinder and the upper portion of the end walls, the said means including a generally horizontal plane face formed at the top of each end wall of the housing, a pair of angularly formed, relatively small and light weight end closure members each having an under-side plane face in co-planar slidable engagement with the said plane face on an end wall and a vertical face having an arcuate cushioning member to engage and cooperate with a said end of the cylinder in sealing engagement therewith, and spring means to hold the said closure members into engagement with the plane faces on the end walls and against the ends of the cylinder.

7. An intaglio printing machine comprising a printing cylinder rotatably supported in an ink cylinder housing having side walls and end walls with bearings permitting axial adjustment of the cylinder, each of the said walls having a smooth horizontal surface on its upper edge, and all in horizontal alignment in the same plane, means to close the spaces between the cylinder and the housing, including side closure members having smooth horizontal surfaces on their under side to sealingly engage the horizontal surfaces on the upper edges of the side walls, and including relatively small and light weight end closure members having smooth horizontal surfaces on their under sides in co-planar engagement with the horizontal surfaces on the upper edges of the housing end walls, the said end closure members having renewable wearing members to sealingly engage the ends of the cylinder, and means to resiliently press each end closure member against an end wall and also toward the end of the cylinder.

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