June 3, 1952 L. C. SEED 2,599,417

PLATE-STRAINING MECHANISM FOR USE IN PRINTING MACHINES

Filed Sept. 1, 1948 3 Sheets-Sheet 1

FIG. 1.

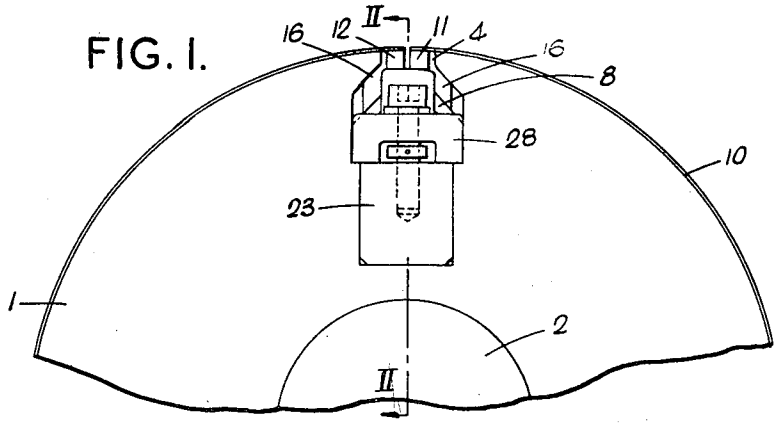


FIG. 4.

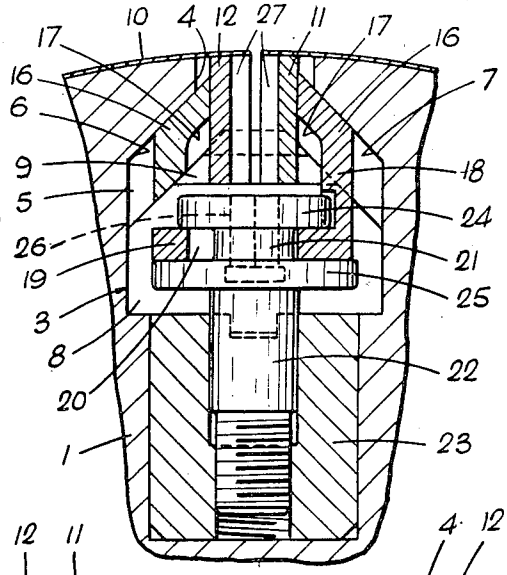


FIG. 5.

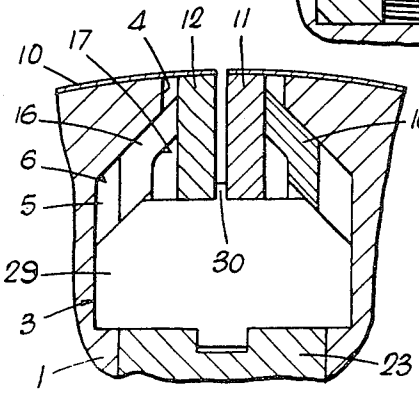
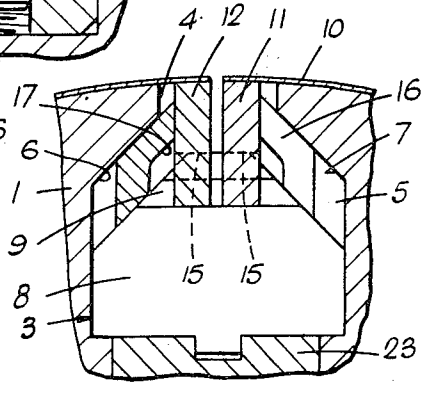


FIG. 6.



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PLATE-STRAINING MECHANISM FOR USE IN PRINTING MACHINES

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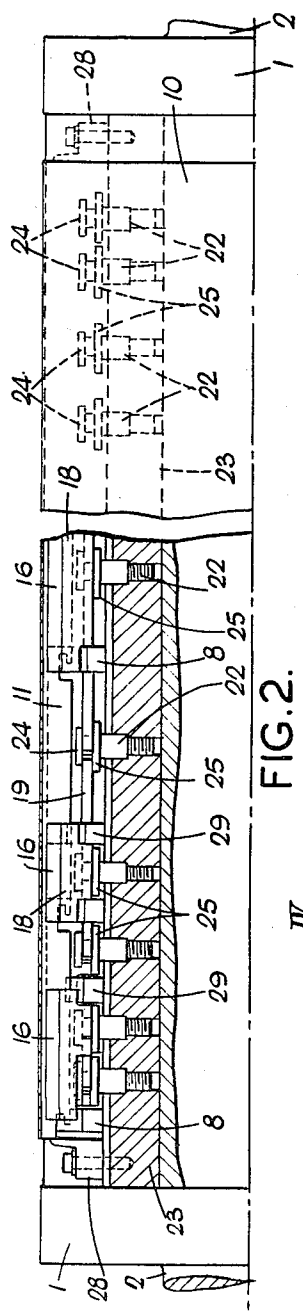


FIG. 2.

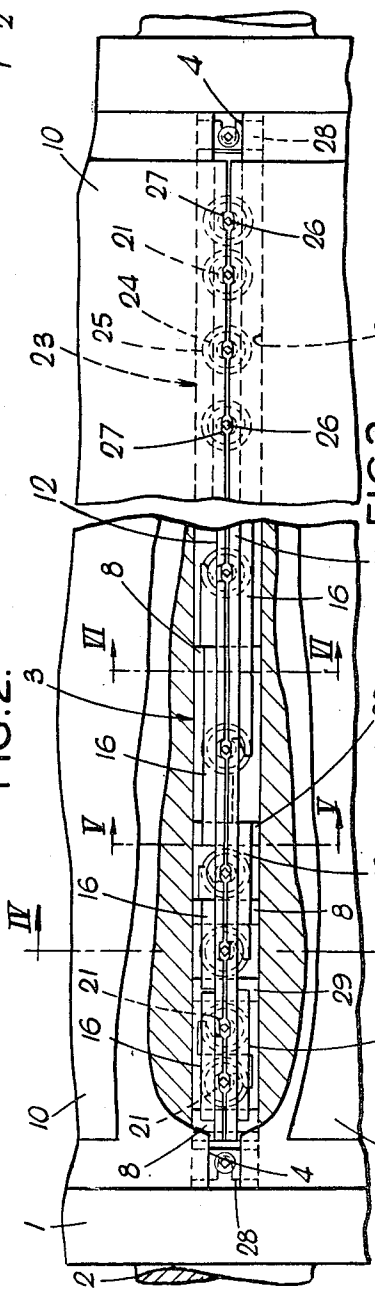


FIG. 3.

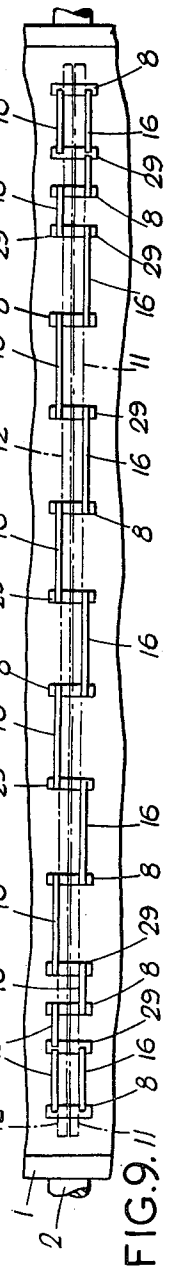


FIG. 9.

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PLATE-STRAINING MECHANISM FOR USE IN PRINTING MACHINES

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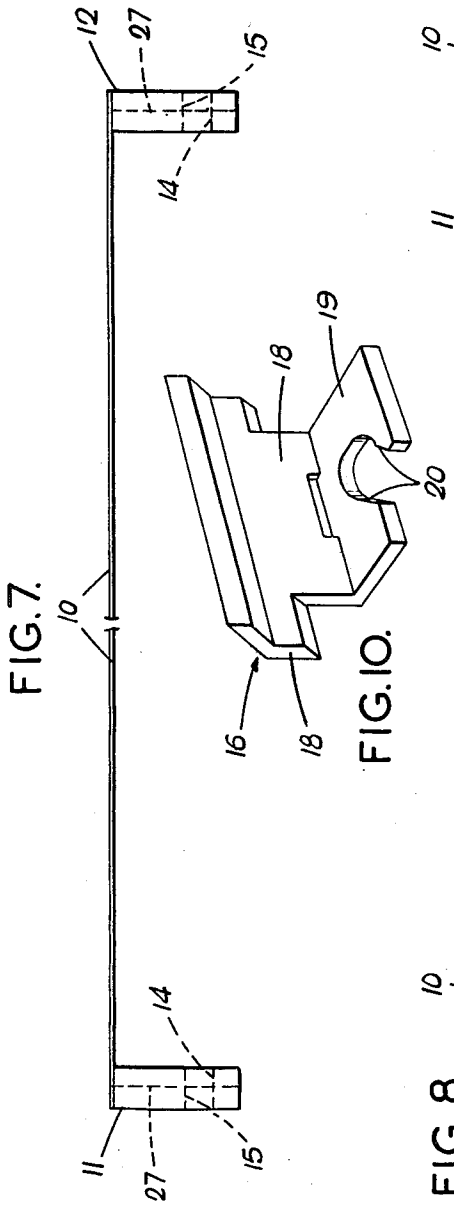


FIG. 7.

FIG. 10.

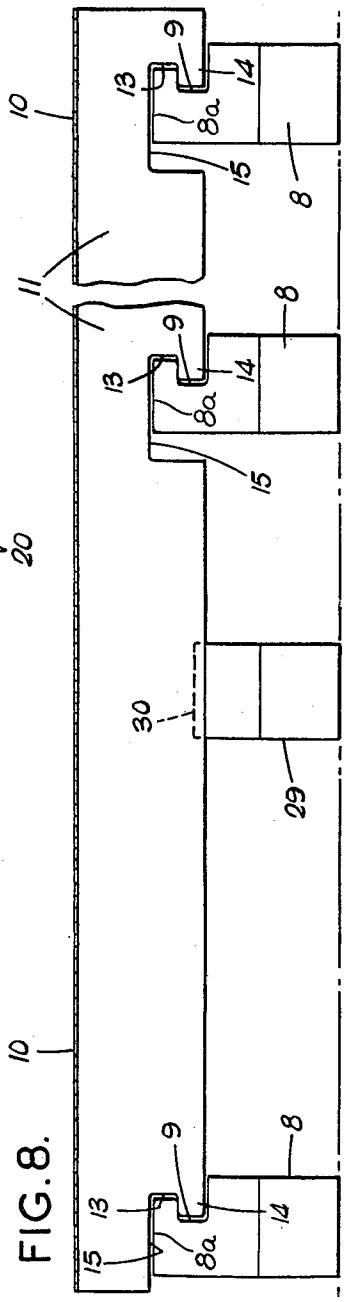


FIG. 8.

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PLATE-STRAINING MECHANISM FOR USE IN PRINTING MACHINES

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Application September 1, 1948, Serial No. 47,187
In Great Britain September 3, 1947

6 Claims. (Cl. 101—415.1)

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This invention relates to mechanism to strain flexible printing plates about the periphery of a printing cylinder. In the specification of the pending application No. 747,912 is described and claimed such a mechanism wherein the ends of a printing plate have secured to their under surface clamping bars which are introduced into a longitudinal or axial slot where ribs on the bars are disposed to enter grooves on guide components fixed to the cylinder within the slots; the bars, when in position in the slot, are urged towards one another in a sense about the cylinder, by radially displaceable pressure components which through wedge action are moved to engage and then to displace the bars towards one another, the ribs on the bars entering the grooves to support the bars against being tilted and constraining them to move tangentially.

This arrangement of mechanism is entirely satisfactory in many applications but where a maximum of the surface area of a plate is required to be available to receive matter to be printed, modification of the arrangement is desired. In that arrangement, the ribs and grooves were disposed to move into cooperation in a sensibly tangential direction and hence the slot in the cylinder had to be made of sufficient width to enable the bars to be passed down radially to carry their ribs into register with the grooves, whereafter they were brought into cooperation by the initial actuation of the pressure components.

Now one feature of the present invention consists in so forming the bars and the guide components that the bars are movable longitudinally of the cylinder to bring tongues formed thereon into engagement with grooves on the guide components. With this arrangement while the bars are still introduced radially into the slot to bring them into radial register with the pressure components, they are then adjusted longitudinally to bring the tongues into the grooves in the guide components in readiness for operation by the pressure components. This enables the slot in the cylinder to be considerably reduced in width while still retaining the same dimensions of the parts, for it is not necessary for clearance in the width of the slot to be provided for ribs as formerly used, to clear the guide components in the circumferential sense, this clearance being now provided in the longitudinal sense.

The invention is illustrated in the accompanying drawing in which Figure 1 is an end view of a part of a printing cylinder, Figure 2 a longitudinal sectional elevation taken approximately

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on the line II—II Figure 1, Figure 3 a plan view of Figure 2 with various parts removed at different points to expose other parts, Figure 4 is a section on the line IV—IV Figure 3, Figure 5 a section on the line V—V Figure 3 and Figure 6 a section on the line VI—VI Figure 3, Figures 4, 5 and 6 being to a considerably larger scale than Figure 3; Figures 7 and 8 are respectively end and side elevations of a printing plate formed in accordance with this invention, and showing also parts cooperating therewith. Figure 9 is a diagrammatic plan and Figure 10 a perspective view of one of the component parts.

Referring to the drawings, the reference 1 indicates a printing cylinder having shaft ends a portion of one of which is indicated at 2; the cylinder is formed throughout its length with a slot 3 having a relatively narrow mouth 4 opening to an enlargement 5 the walls of which have inclined faces at 6, 7 adjacent the mouth.

Disposed within the enlargement 5 is a longitudinally disposed series of spaced guide blocks 8 each having a locating surface 8a and a groove 9 in one of its faces which is transverse to the length of the slot 4, so that the openings of these grooves 9 are directed in the longitudinal sense of the cylinder, the disposition of these blocks being shown diagrammatically in Figure 9.

The printing plate 10 is provided, as is most clearly shown in Figures 7 and 8, with bars 11, 12 at each of its edges, these bars being secured as by welding to the undersurface of the plate. Each bar is formed along its length with bayonet slots 13 at intervals corresponding to the disposition of the guide blocks 8, the slots providing tongue members 14, the surfaces of which mate with the grooves 9.

The width of the opening of the bayonet slots is such that they pass easily over the guide blocks 8 until the transverse faces 15 of the slots seat against fixed locating surfaces 8a on these blocks; it will be clear that to effect this, the plate 10 is laid about the cylinder 1 and the two bars 11, 12 are introduced into the open mouth of the slot 4. The tongues 14 are now in longitudinal register with the grooves 9 in the blocks 8 so that by moving the bars 11, 12 longitudinally in the slot 4 the tongue members are moved into the grooves to lock the bars 11, 12 against centrifugal action when the cylinder 1 is rotated.

In order to move the bars 11, 12 towards one another, so as to strain the plate 10 about the cylinder, i. e. to move the bars in a tangential sense of the cylinder, there is provided a series

of pressure components 16 arranged in alternation at opposite sides of the enlargement 5. Each said component has a sloping surface to engage one or other inclined face 6 or 7 on the wall of the enlargement 5 and each pressure component 16 is shaped or cut away at 17 so as to leave a pressure face which is disposed to engage the relevant bar 11 or 12 closely behind its junction with the plate 10. Each pressure component 16 is extended by a wall 18 which is turned in to provide a flange 19 having an open-mouth slot 20.

The flange 19 of each pressure component embraces an operating screw 21 (Figure 4) having a plain shank 22 seating snugly in a radial bore in a plug 23 in the cylinder 1, the screw engaging a thread formed in the plug. The screw 21 is formed with flanges 24, 25 between which the flange 19 snugly extends and the screw is formed with a squared socket 26 to receive an operating key. The bars 11, 12 are formed with opposed recesses 27 (Figure 3) to provide openings through which the key can be passed into the socket from outside the cylinder.

Hence, when a plate 10 has been wrapped about the cylinder 1 and the bars 11 and 12 have been moved longitudinally to carry their tongues 14 into the recesses 9 in the blocks 8, the plate can be strained tightly about the cylinder by operating the various screws 21. As the screws are rotated in one direction they move radially outwards of the cylinder 1 and so cause the various pressure components 16 also to move radially outwards. This movement causes the inclined face 6 or 7 to exert a wedge action on the adjacent pressure component 16 causing it to move into engagement with the associated bar 11 or 12 and then to thrust that bar towards the other bar and so to strain the plate.

It will be understood that the various operating screws 21 along the length of the cylinder will be actuated in turn in the manner described so that in the result the bars 11, 12 will be moved towards one another along their lengths.

The engagement between the tongues 14 on the bars 11, 12 and the grooves in the blocks 8 not only operates to hold the bars against centrifugal loading but also operates to hold the bars against any substantial tilting due to the application of pressure by the components 16, it being clear that during the movement of the bars 11, 12, their tongues 14 will slide over the surfaces of the grooves 9 in the blocks 8.

In order to hold the plate 10 and its attached bars 11, 12 against longitudinal movement when once the tongues 14 on the bars have been moved into the grooves in the guide blocks 8 releasable or detachable positioning members 28 (Figures 2 and 3) can be fitted to the cylinder 1 to abut the ends of the bars.

The outer faces of the guide blocks 8 which form a support in the radial sense for the bars 11, 12, and the corresponding edges of the bars (and also the engaging faces of the tongues 14 and grooves 9) can be of part-cylindrical form centred about the axis of the cylinder; however as the straining movement is relatively small, a sufficiently close approximation to the circular movement can for all practical purposes be obtained by making those faces flat and tangential to the cylinder, as is shown in the drawings.

In addition to the guide blocks 8 intermediate supporting blocks 29 (Figures 8 and 2), can be provided to support the bars 11, 12 at their free inner edges, these intermediate blocks being arranged in alternation with the guide blocks 8; here again the meeting faces of the bars and blocks can be either part cylindrical or tangential.

Each supporting block 29 can be formed at its outer or bar-supporting surface with a rib 30 (Figure 5) extending in the longitudinal sense of the cylinder. The ribs of the various blocks operate to position the bars 11, 12 centrally, i. e. in the sense axially of the cylinder, it being understood that each rib is positioned between the two guide bars; these ribs will also operate to assist in the plate straining operation for, as the pressure components 16 operate to apply pressure to the bars at a distance radially beyond the ribs 30, the ribs can function as a heel about which the bars will tend to rock. These ribs can if desired be rounded or tapered to assist in this action and two of the corners of the tongues 14 can be slightly backed-off for the same reason and also to facilitate the movement of the tongues longitudinally into the grooves 9.

The bars 11, 12 can be secured as shown at the extreme ends of the plate 10 so that when the bars 11, 12 are drawn together these ends abut or nearly so, or one bar can be secured within the corresponding end of the plate 10 so that this end (when the bars are drawn together) overlaps the other end.

The presure components 16 can be arranged in alternation on opposite sides of the slot 4 throughout the entire length of the cylinder 1 but it is preferred as is shown to space them more closely at the ends of the cylinder and at the extreme ends of the cylinder the pressure components can be opposed to one another as shown in Figure 9.

It will now be clear that the width of the mouth 4 of the longitudinal gap in the cylinder 1 is governed only by the dimensions of the bars 11, 12 for the requisite mechanical strength and of the requisite movement of the bars towards one another to effect satisfactory straining of the plate about the cylinder. The width of the slot can in consequence be relatively small so that very little of the circumferential surface of the cylinder is unavailable for printing; indeed, by arranging that the ends of the plate almost touch, it is only the very small longitudinal strip about the ends of the plate which could not be used to receive matter to be printed.

What I claim is:

1. In combination a printing cylinder having a longitudinal slot in its periphery, guide blocks in slot providing a series of fixed locating surfaces transverse to the length of the slot, a printing plate having bars secured at the undersurface of the plate at its ends, the said bars having a series of transverse locating surfaces and having endwise movement for locking engagement with the fixed locating surfaces and mechanism housed in said slot to urge the bars towards one another to strain the plate about the cylinder, the said mechanism comprising individually operable pressure components which are contained in the slot and disposed to engage remote faces of the said bars and are disposed to thrust the bars towards one another by wedge action, and operating screws positioned between the guide blocks to actuate the said pressure components.

2. In combination, a printing cylinder having a longitudinal slot, a flexible printing plate having bars secured to its ends at the undersurface of the plate, the said bars extending radially into the slot, guide blocks disposed in a longitudinal

series along the slot, the said blocks having locating surfaces disposed transversely of the slot and being formed for locking engagement by mating surfaces on the bars, a series of intermediate blocks supporting the bars between the guide blocks, pressure components arranged in the slot at each side of the bars, and means disposed in the slot to move the pressure components into engagement with the bars to move the bars towards one another.

3. In combination, a printing cylinder having a longitudinal slot, a flexible printing plate having bars secured to its ends at the undersurface of the plate, the said bars extending radially into the slot, guide blocks disposed in a longitudinal series along the slot, the said blocks having locating surfaces disposed transversely of the slot and being formed for locking engagement by mating surfaces on the bars, a series of intermediate blocks supporting the bars between the guide blocks, a longitudinal series of pressure components disposed in the slot to engage the bars at remote faces thereof, and a corresponding series of operating screws to operate the pressure components individually.

4. In combination, a printing cylinder having a longitudinal slot, a flexible printing plate having bars secured to its ends at the undersurface of the plate, the said bars extending radially into the slot, guide blocks disposed in a longitudinal series along the slot, the said blocks having locating surfaces disposed transversely of the slot and grooves for endwise locking engagement by mating surfaces on the bars, a longitudinal series of pressure components disposed in the slots to engage the bars at remote faces thereof, the said pressure components engaging inclined faces formed in the slot, and a series of radial operating screws positioned between the guide blocks to thrust the said pressure components against the inclined faces whereby the bars are thrust towards one another.

5. In combination, a printing cylinder having a longitudinal undercut slot in its periphery with walls having inclined faces, guide blocks in the slot and having fixed locating surfaces formed

transversely to the length of the slot, a flexible printing plate having bars secured to its ends at the under surface of the plate, the said bars having transverse locating surfaces engaging the locating surfaces on the guide blocks, means rendered effective by longitudinal movement of the bars, to interlock said bars with guide blocks engaged thereby, pressure components disposed in the slot for exerting pressure on one side of each bar and having sloping surfaces formed to engage the inclined faces of the walls of the slot, and operating screws positioned between the guide blocks for moving the pressure components to thrust the bars toward one another and thereby tighten the plate on the cylinder.

6. In combination, a printing cylinder having a longitudinal undercut slot in its periphery with walls having inclined faces, guide blocks in the slot and having fixed locating surfaces formed transversely to the length of the slot, a flexible printing plate having bars secured to its end at the under side of the plate, the said bars having transverse locating surfaces movably engaging the locating surfaces on the guide blocks, means rendered effective by longitudinal movement of the bars, to interlock said bars with guide blocks engaged thereby, pressure components disposed in the slot for engagement with one side of each bar and formed with sloping surfaces for engaging the inclined faces on the walls of the slot, and operating screws positioned between the guide blocks for manipulating the pressure components to exert a wedge action between the bars and the inclined walls of the slot and thereby urge the bars toward one another.

LESLIE CHAMBERLAIN SEED.

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