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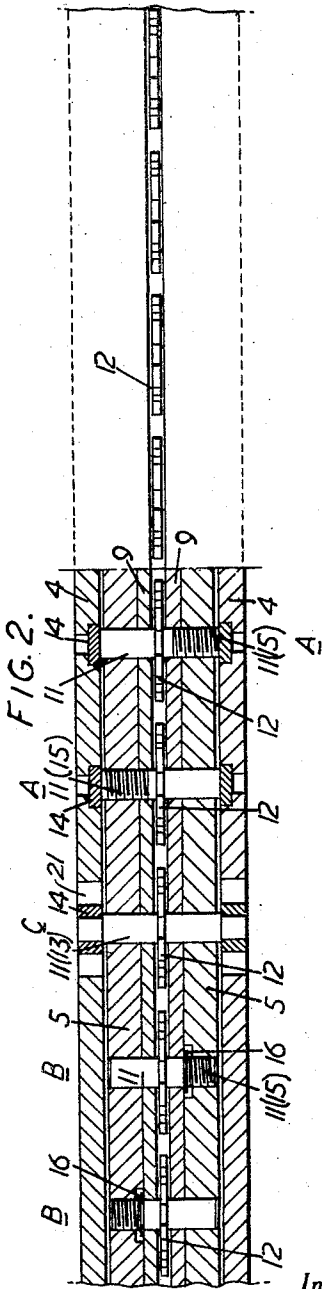
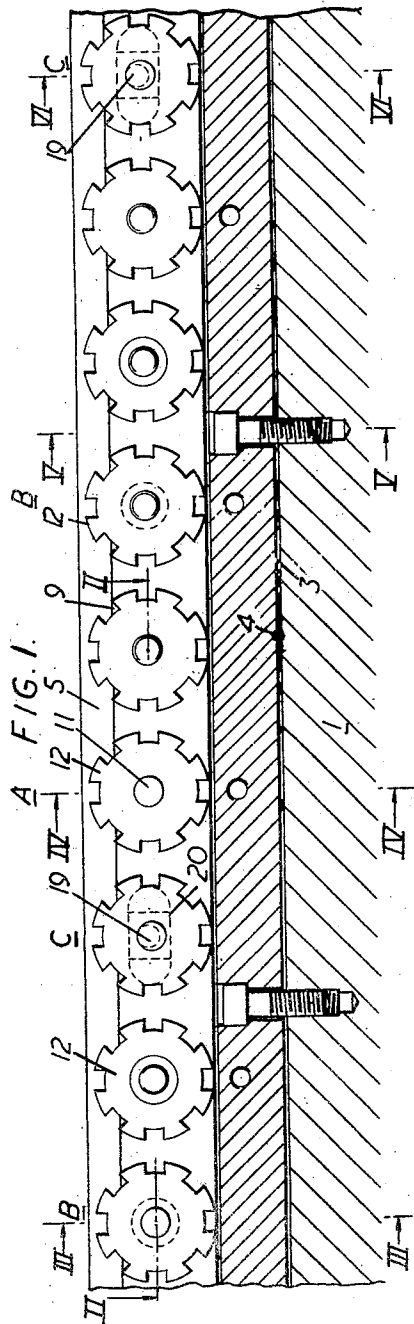
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2,998,768

MECHANISM FOR CLAMPING FLEXIBLE PRINTING PLATES

Filed Dec. 22, 1958

3 Sheets-Sheet 1



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FIG. 3

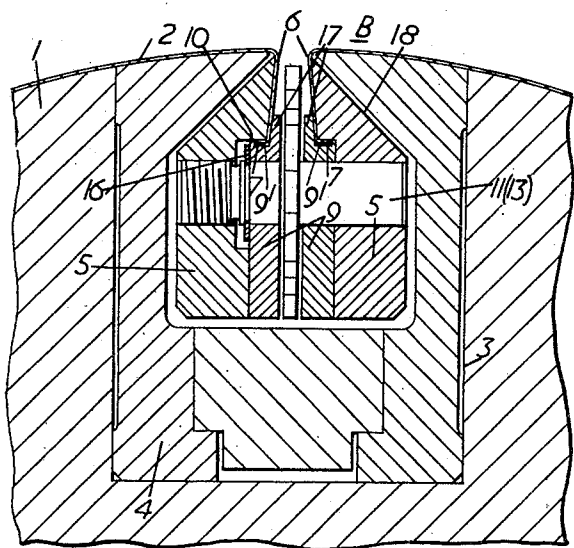


FIG. 7.

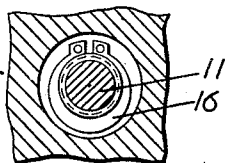
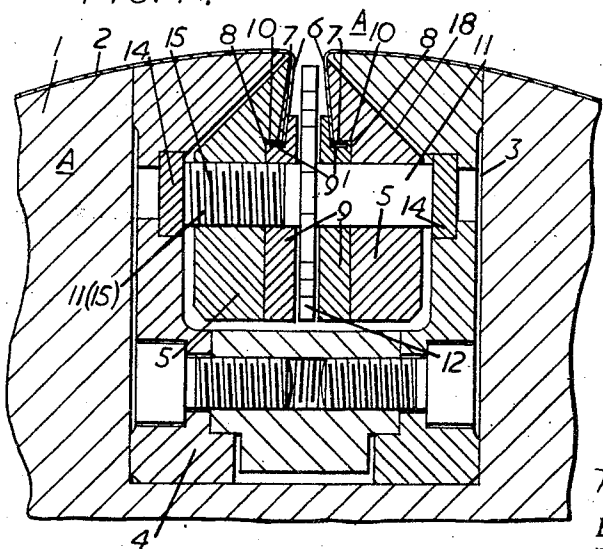


FIG. 4.



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FIG. 5.

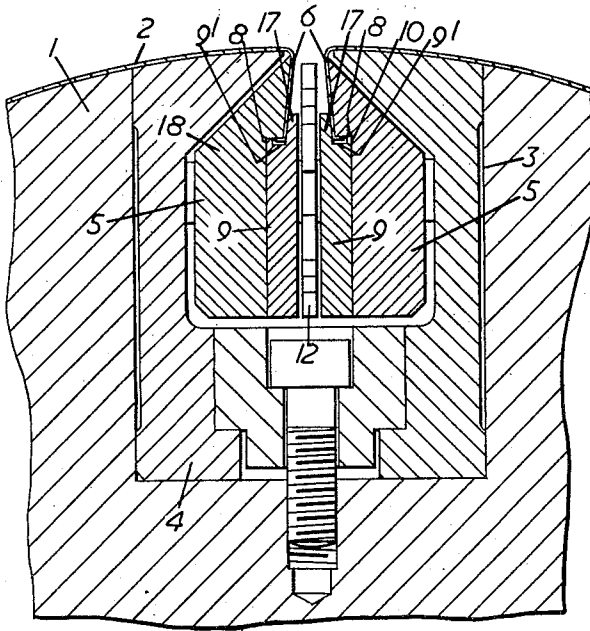
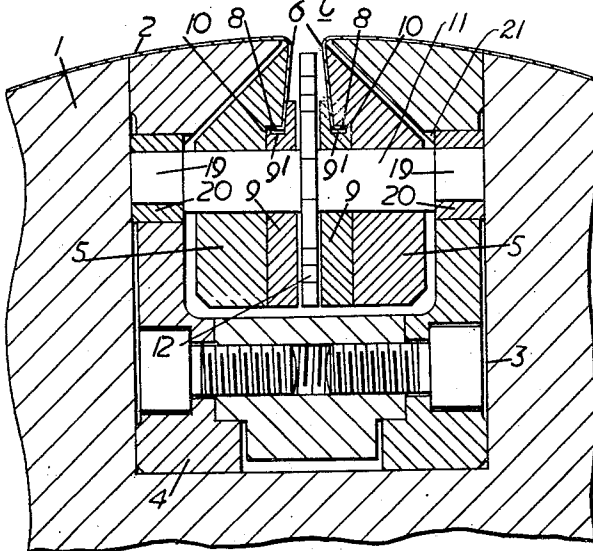


FIG. 6.



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MECHANISM FOR CLAMPING FLEXIBLE PRINTING PLATES

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This invention relates to mechanism for securing a flexible printing plate to the plate cylinder of a printing machine, especially, but not exclusively, an offset printing machine.

Various proposals have already been made for that purpose and according to certain of the proposals the ends of the plate are bent, or are provided with extensions, to pass into an axial groove or gap formed in the periphery of the cylinder. In that gap are disposed clamping bars which are formed with grooves to receive turned-out flanges or lips at the inner ends of the plate. The gap accommodates some mechanism or another to move the bars more or less tangentially in the gap to pull the plate and to secure it tightly to the cylinder.

It has been found that on account of the force which has to be applied to the plate ends, there is a tendency for the lips to become embedded in the grooves in the bars when the mechanism is operated to release the plate. The gap between the bars and the bent down ends of the plate is made as small as possible to avoid interrupting the continuity of the printing surface for more than is necessary. The gap, being thus desirably small, renders it difficult if not impossible to gain access to the embedded end of the plate with the result that time is wasted and the plate even damaged in attempting to dislodge the lip.

It is the main purpose of this invention to provide a mechanism which will avoid this difficulty.

According to the present invention the plate clamping mechanism is arranged so as, when operated to release a plate, to apply a stripping action to the lips so as forcibly to remove them from the grooves in the bars.

The invention can be carried into effect in various ways. In a convenient arrangement the bars are formed in two parts which define the lip-receiving groove between them. The operating mechanism for the bars is arranged so that, when it is operated to release a plate, it effects relative movement between the two parts of the bar and so ensures that the lips are dislodged. This mechanism is of a type which is operable from outside the groove, and so the difficulty of releasing an embedded lip no longer applies.

The invention is illustrated in one form of construction in the accompanying drawings, in which: FIGURE 1 is a longitudinal sectional elevation taken through the usual gap formed in a printing cylinder; FIGURE 2 is a sectional plan view, the section being taken on the line II—II, FIGURE 1, FIGURES 3, 4, 5 and 6 are sectional elevations taken respectively on the lines III—III, IV—IV and V—V and VI—VI in FIGURE 1, and FIGURE 7 is a sectional detail view.

Referring to the drawings, a part of the body of the printing cylinder of a printing machine is indicated at 1, this cylinder requiring to have a printing plate 2 wrapped about its periphery, as shown in FIGURES 3-6. Such a plate is commonly of metal. The cylinder is formed in its periphery with an axially extending groove 3 in which is held a unit 4 carrying clamping bars 5 and a mechanism for moving those bars towards and away from one another.

The ends of the plate 2 are bent down at 6 to pass into the gap between the clamping bars 5, and the extreme inner ends of the plate are bent out to provide lips 7

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for attaching the plate to the bars. The lips 7 extend into grooves 8 formed in the clamping bars 5 so that movement of the bars 5 towards one another will result in a pull being applied to the ends of the plate via the lips 7. The radially outermost walls of the grooves 8 and the lips 7 act as radially interlocking parts engageable with each other for restraining the plate end portions 6 against outward movement radially with respect to the cylinder 1.

It is the purpose of this invention to ensure that when the bars 5 are operated for the purpose of releasing the plate, the lips 7 shall not remain embedded in the grooves 8. To achieve this result the recesses 8 are formed conjointly by the walls of recesses in the main bar parts 5 and by the outer surfaces of shoulders 9' on supplementary parts 9. The ends of the shoulders are formed either locally or continuously with upstanding portions or beads 10 against which the ends of the lips 7 on the plate abut.

Thus by moving the supplementary parts 9 in the lengths of the recesses 8 relative to the main clamping bar part 5 during the plate releasing operation, the beads press against the ends of the lips 7 to eject them from the grooves 8.

The particular clamping mechanism shown in the drawing comprises a series of pins 11 disposed in and along the length of the groove and within the circumference of the cylinder 1. These pins have between their ends operating discs 12 which extend out into the gap between the bent down parts 6 of the plate. The parts 13 of the pins at each side of the discs are cylindrical to turn in openings in the supplementary parts 9 and in openings in the main bar parts 5. The ends of the cylindrical parts of the pins marked generically A in FIGURE 4 react against parts 14 in the walls of the unit 4 so that the pins are held against axial movement. The pins A have the cylindrical surfaces at one side of the discs screw threaded as shown at 15 in FIGURE 4, and others of the pins A at the other side of the discs are similarly screw threaded (see FIGURE 2). Thus, by turning the pins at the different points along the length of the main bars 5, the latter can be moved towards and away from one another and skewed to one another as may be required.

In addition, certain of the pins marked generically at B and shown in FIGURE 3 are not only screwed into one or other of the main bar parts 5, but are also provided with outstanding flanges 16 to engage behind the shoulders 9' on the supplementary parts 9. Thus the purpose of the invention is served for when these pins B (which are oppositely disposed as seen in FIGURE 2) to operate respectively the two supplementary bars 9) are turned they move axially with respect to the main parts 5, and their flanges 16 press against the shoulders 9' of the supplementary parts 9 which are thus moved in predetermined paths from retracted positions to operated positions whereby their beads 10 strip the lips 7 from the groove 8.

As is shown in FIGURE 7 each flange 16 can be constituted by a C ring which is sprung into a circumferential recess in the related pin 11.

The supplementary parts 9 also have upstanding flanges 17 which trap the lower ends of the downturned flanges 6 of the plate 2 between the parts 5 and 9 when the supplementary parts 9 are moved toward the associated main bar parts 5.

The main bar parts are sloped at 18 at their outer ends to cooperate with corresponding faces on the side walls of the unit 4.

Further pins marked generically at C and shown in detail in FIGURE 6 can also be provided. These pins have cylindrical parts 11 which however are not screw

threaded, but merely turn in openings in the main and supplementary bar parts 5 and 9, the ends of these pins having eccentric stubs 19 engaging in slippers 20 mounted in slots 21 in the side walls of the unit 4. These pins C enable the bent down ends of the plate to be drawn radially into the groove.

The clamping mechanism described thus enables, by manipulation of the various pins A and C, the control of the tensioning and setting of the plate 2 on the cylinder 1 to obtain proper registration in the printing operation. By the manipulation of the pins B the plates can readily be ejected from the groove in the clamping bars 5 and supplementary parts 9 by which they had been tensioned.

I claim:

1. In a printing cylinder construction, a cylinder formed at its outer surface with a groove extending parallel to the cylinder axis for receiving the end portions of a flexible printing plate wrapped around said cylinder, which end portions are turned inwardly to extend into said groove and are formed at their extreme ends with lips extending oppositely and away from each other; two clamping bar structures mounted in said groove respectively between said plate end portions and the groove walls and having recesses for receiving said lips; ejecting means mounted within said groove for movements in predetermined paths from retracted positions to operated positions in engagement with said lips for ejecting the latter from said recesses; and operating means mounted in said groove within the circumference of said cylinder and being operable in said groove for moving said bar structures relatively to each other and to the groove walls for tensioning the plate about the cylinder and for moving said ejecting means to operated positions.

2. In a printing cylinder construction, a cylinder formed at its outer surface with a groove extending parallel to the cylinder axis for receiving the end portions of a flexible printing plate wrapped around said cylinder, which end portions are turned inwardly to extend into said groove and are formed at their extreme ends with lips extending oppositely and away from each other; two clamping bar structures mounted in said groove respectively between plate end portions and the groove walls and having recesses for receiving said lips; operating means for moving said bar structures relatively to each other and to the groove walls for selectively tensioning the plate about the cylinder and for relieving the tension on the plate; and means operable for ejecting said lips from said recesses when said bar structures have been moved to relieve the tension on said plate.

3. Printing cylinder construction according to claim 2 in which each of said bar structures comprises a main clamping bar part and a supplementary bar part contiguous thereto, said main and supplementary bar parts being formed conjointly to define between them the lip receiving recess.

4. Printing cylinder construction according to claim 3 including means for moving said main clamping bar and supplementary bar parts relatively to one another, said last mentioned means comprising a plurality of pins each journaled to rotate freely in one of said bar structures and in the supplementary bar part of the other of said bar structures, a threaded portion of said pin engaging a threaded opening in the main bar part of said other of said bar structures, said pin having means thereon for moving the supplementary bar part of said other of said structures axially of said pin in response to axial movement of said pin relative to the main bar part of said other of said structures.

5. Printing cylinder construction according to claim 3 in which one of said bar parts defines one wall of the recess and has an upstanding portion defining the outer end of the recess, in which the bar parts of each of said bar structures are relatively movable, and in which said upstanding portion of said one of said bar parts is engageable with the edge of the associated plate lip for

urging the lip out of the recess when said bar parts are moved relatively.

6. Printing cylinder construction according to claim 3 in which said operating means comprises a first series of components disposed at intervals along the length of the groove for moving the two bar structures away from and toward one another to tension and release said plate, said means for ejecting the plate lips from the recess when said bar structures are moved toward each other to release said plate comprising a second series of components disposed at intervals along the length of said groove.

7. Printing cylinder construction according to claim 6 in which said first and second series of components are individually operable respectively for moving said bar structures away from and toward one another to tension and release said plate, and for moving the main clamping bar and supplementary clamping bar parts relatively to one another to eject the plate lip from the recess conjointly defined by said bar parts.

8. Printing cylinder construction according to claim 7 in which one of said bar structures is formed with openings and the other of said bar structures is formed with threaded openings, and in which each of certain of said components comprises a rotatable pin extending across the cylinder groove and having a disc portion on the pin between the ends thereof, the pin having on one side of the disc portion a cylindrical end rotatably received in one of the openings in said one of said bar structures, and the pin having on the opposite side of the disc portion a screw portion engaging one of the threaded openings in said other of said bar structures.

9. Printing cylinder construction according to claim 8 in which said one of said bar structures is also formed with threaded openings and said other of said bar structures is also formed with further openings, and in which others of said components comprise other pins formed similarly to the first mentioned pins but which are reversely disposed with respect to the latter, said others of said pins having their cylindrical ends rotatably received in said further openings in said other of said bar structures and their screw portions engaging said threaded openings in said one of said bar structures.

10. Printing cylinder construction according to claim 8 including still further pins spaced along said bar structures and being rotatable therein, said further pins having eccentric portions journaled in said cylinder whereby rotation of said further pins will draw said bar structures radially into said groove.

11. In a printing cylinder construction, a cylinder formed at its outer surface with a groove extending parallel to the cylinder axis for receiving the end portions of a flexible printing plate wrapped around said cylinder, which end portions are turned inwardly to extend into said groove and are formed with first radially interlocking parts; two clamping bar structures mounted in said groove respectively between said plate end portions and the groove walls and having second radially interlocking parts cooperable with said first radially interlocking parts for restraining said plate end portions against outward movement radially of said cylinder; ejecting means mounted within said groove for movements in predetermined paths from retracted positions to operated positions in engagement with said first radially interlocking parts for disengaging the latter from said second interlocking parts; and operating means mounted in said groove within the circumference of said cylinder and being operable in said groove for moving said bar structures relatively to each other and to the groove walls for tensioning the plate about the cylinder and for moving said ejecting means to operated positions.

12. In a printing cylinder construction, a cylinder formed at its outer surface with a groove extending parallel to the cylinder axis for receiving the end portions of a flexible printing plate wrapped around said cylinder,

which end portions are turned inwardly to extend into said groove and are formed with first radially interlocking parts; two clamping bar structures mounted in said groove respectively between said plate end portions and the groove walls and having second radially interlocking parts cooperable with said first radially interlocking parts for restraining said plate end portions against outward movement radially of said cylinder; ejecting means mounted within said groove for movements in predetermined paths from retracted positions to operated positions in engagement with said first radially interlocking parts for disengaging the latter from said second interlocking parts; and operating means mounted in said

groove within the circumference of said cylinder and being operable in said groove for moving said bar structures relatively to each other and to the groove walls for tensioning the plate about the cylinder and for moving said bar structures reversely for relieving the tension on said plate, and means for selectively moving said ejecting means to retracted and operated positions.

References Cited in the file of this patent

UNITED STATES PATENTS

2,195,491	Marchev	Apr. 2, 1940
2,768,578	Park et al.	Oct. 30, 1956
2,910,939	Mosegaard	Nov. 3, 1959