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PLATEN-BED PRESS FOR SIMULATING CYLINDER PRESS PRINTING

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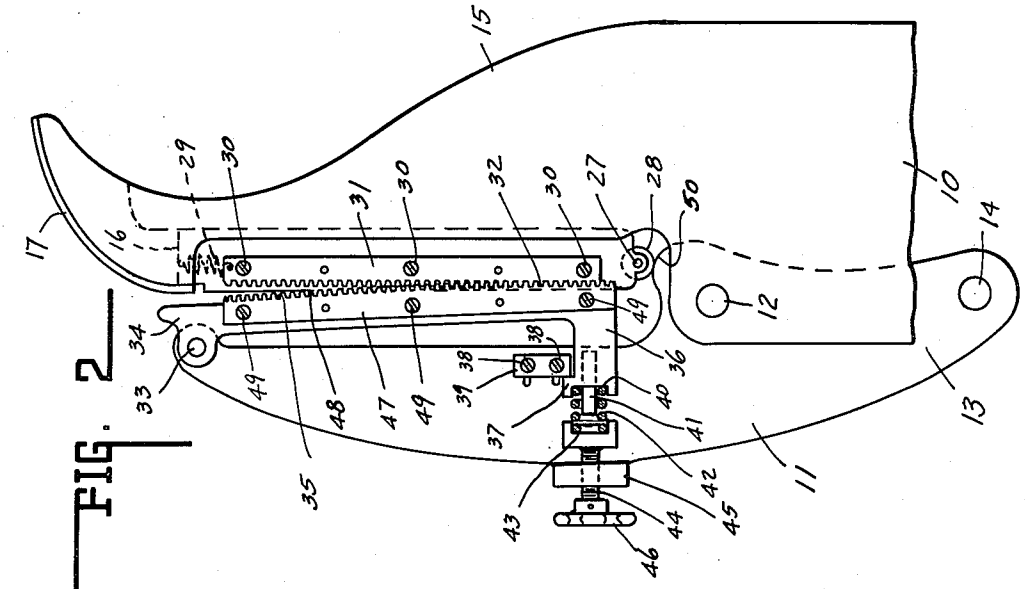


FIG. 2

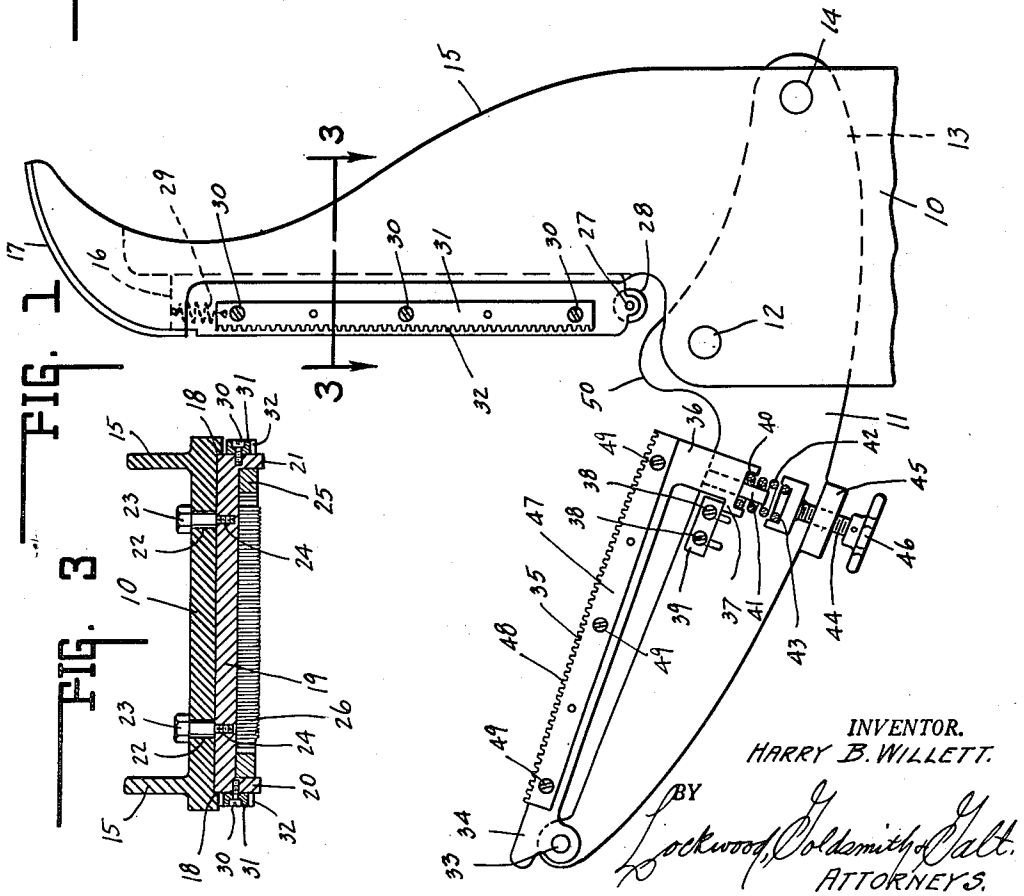


FIG. 1

FIG. 3

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PLATEN-BED PRESS FOR SIMULATING CYLINDER PRESS PRINTING

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8 Claims. (Cl. 101—297)

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This invention relates to a platen-bed printing press.

The chief object of this invention is to simulate cylinder press operation with a platen press.

The chief feature of this invention resides in curving one or both of the two members comprising the type supported bed and the platen and pivotally mounting the curved member so that the platen and type bed when associated together for printing action have a progressive operative contact over the face thereof instead of simultaneous facial contact customary in a platen-bed press.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings, Fig. 1 is a side elevation of of a platen-bed press, or rather so much of it as is necessary for an understanding of this invention, with one form of the invention embodied therein, the press being shown in open position.

Fig. 2 is a similar view of the same parts of the press, the parts being shown in a position immediately preliminary to the actual and final printing position wherein the press is closed.

Fig. 3 is a transverse sectional view taken on a line 3—3 of Fig. 1 and in the direction of the arrows.

As previously stated, only so much of a conventional platen-bed press as is necessary to an understanding of the invention is herein illustrated. Such a press includes a main frame 10, a platen supporting frame 11 pivoted on the main frame at 12 and having an arm extension 13 apertured as at 14 for connection to a suitable source of power whereby the frame is tilted clockwise from the open position shown in Fig. 1 to the closing position shown in Fig. 2.

The main frame 10 is provided with reinforcing webs 15 and is suitably recessed as at 16 for type bed mounting. The upper end of the frame terminates in the curved bearings 17, which are adapted to be engaged by the ends of the inking roll or rolls not shown. The main frame 10 is recessed on its forward face and provides in effect a channel arrangement 18.

The type bed is indicated by the numeral 19 and includes the type receiving pocket flanges 20 which herein have a face 21 at opposite sides, slightly less that the type heighth so that the ends of the ink roll or rolls may bear thereon

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when said rolls pass over the type for inking between impressions.

The main frame is apertured as at 22 and type bed anchoring bolts 23 extend therethrough and have threaded engagement with the type bed as at 24 for securing same to the main frame. The apertures 22 are elongated vertically for the purpose hereinafter set forth. Included within the confines of the type bed and suitably secured thereto by wedges, etc., is the type frame structure 25 and the type 26. Herein all the type has the printing faces coplanar. The lower end of the flat bed 19 pivotally supports as at 27 at each side a cam follower roll 28, the purpose of which will be set forth in full hereinafter.

If desired, there may be interposed in the upper end of the type bed compression springs 29 which will assist gravity in normally moving said bed to the lowermost position permitted by the vertically elongated apertures 22 through which extend the anchoring bolts 23 whereby the bed is reciprocably attached to its supporting frame. Normally such bolts 23 lie in the lower ends of the slightly elongated slots 22. It will be noted that the bed with the above mentioned cam follower roll 28 is shown in such lowermost position in Fig. 1. Secured to each side of the type bed as at 30 is a linear rack 31 having the forwardly projecting teeth 32 thereon, the function of which will presently appear.

At the upper and outer free end of the platen supporting frame 11 there is provided the pivots 33, which pivotally support the upper end 34 of the platen structure. This platen structure has a curvature indicated at 35 of a relatively large radius and the axis of the curvature is parallel to the pivotal axis of the pivoting means indicated at 33 and the pivotal axis of the platen frame upon the main frame at 12. The lower end of this curved platen includes forward extensions 36 at each side and which straddle the platen supporting frame. Each terminates in an offset portion 37 serving as a stop. Each arm of the platen supporting frame adjacent the extension 36 adjustably mounts as at 38 a block 39. This limits the maximum outward movement or position of the non-pivoted end of the platen. Each extension 36 is recessed as at 40 and projecting therefrom and beyond the end of the extension 36 is the central pin, guide or retainer 41. A coil spring 42 is seated in the recess 40 and the opposite end bears upon a guide or retainer 43 carried by the threaded member 44 adjustably mounted in the lateral bracket 45,

carried by the arm of the platen supporting frame. A hand wheel 46 on the end of the threaded member 44 is provided to adjust the static position of the retainer 43 and thereby determine the force of spring 42 constraining the platen shoulder 37 into engagement with the stop 39.

Upon each side of the platen there is provided a rack of similar curvature corresponding to that of curvature 35 of the platen and such curved rack 47 includes the teeth 48. Such curved rack is secured to the side of the platen as at 49. Herein each arm of the platen supporting frame 11 includes the cam 50 juxtapositioned to the follower 28. The press thus illustrated and described herein is operated in the usual manner with these additions and distinctions.

A conventional platen press simultaneously applies a type impression to a sheet to be printed and carried by the platen. Previous thereto as is well known the type faces have had ink applied thereto by the ink roll or rolls, not shown, such roll or rolls moving downwardly across the face of the type when the platen is open or lowered, as shown in Fig. 1, and moving upwardly and rearwardly (to the right) before the platen is closed for printing purposes, see Fig. 2. Somewhat similar rolls are illustrated at 48, see Fig. 4, in the Patent No. 1,034,083 to Clark.

Herein the same operations are employed, with the following modifications. As the platen moves into printing position immediately adjacent the type bed the cam 50 engages follower 28 and the teeth 48 seek and seat or mesh with the teeth 32 at the lower ends of the two pairs of racks on the type bed and the platen. This position is shown in Fig. 2. The cam and follower facilitate such meshing and insure predetermined positioning so that interference or non-meshing does not occur.

Then, as the platen supporting frame 11 is further moved clockwise into the completely closed position, the teeth of the four racks progressively mesh, or rather the meshing contact progresses from the bottom toward the top, until, when the teeth at the top of the racks are in meshing engagement, the printing operation has been effected, that is, the ink impression has been transferred from the type faces to the sheet to be printed. It will be obvious that such transfer is of progressive character from the bottom of the sheet, as it were, to the top and in this respect the printing action simulates that obtainable with a cylinder press, as well understood in the art. It will be observed that the yielding means supporting what might be termed the curved and pivoted platen yields toward the left or platen supporting frame 11 as the latter is moved into final printing position. Such yielding or accommodation is necessary in order to secure desired rolling, i. e. progressive, line by line contact of the platen (or sheet carried thereon) with the type in the bed. In other words, the springs 42 constitute retractible means which normally position the lower free end of the platen to have initial contact with such bed. At the same time the reciprocable movement of the latter in its supporting frame, initiated by the engagement of cam 50 with roller 28 and continued by the intermeshing of racks 47 and 31, is necessary in order to provide against slippage between the bed and platen. As previously described, the compression springs 29 insure return movement of the bed to its lowermost position and thus for a repetition of the printing

operation, when in the course of its outward swinging movement the cam 50 is disengaged from follower roll 28.

During the entire printing operation or impression transfer the racks are in constant mesh, although different portions of the racks at different portions of the impression transfer interval naturally are in contact.

The disclosure herein is directed toward the simplest embodiment of the invention and the preferred form, it being obvious that the curved platen may be pivotally supported at its lower end and yieldingly mounted at its upper end. This constitutes a mere reversal of the present example. Also, it is contemplated that the type supporting bed may be curved and the platen flat faced. However, this is not preferred, although it is within the scope of the present invention because in setting up the copy or composition this would entail too critical control and would depart too much from the present standard practice, wherein the present type bed of a platen press is flat, the type is type-high and the copy is set up on the conventional table and then the form is locked up. For this reason, primarily the invention has been illustrated as embodying a flat printing form and a curved platen.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein, as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a platen-bed press, the combination of two frames mounted for relative movement towards and away from each other, a printing couple comprising a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis transverse to the direction of such relative movement between said frames, means pivotally mounting one end of one member of said printing couple on its supporting frame for oscillation about a fixed axis on said frame lying parallel with such first named axis, and retractible means normally positioning the free end of said oscillatory member to have initial contact with its cooperating member when said frames are brought together, such contact thereupon progressively continuing towards the pivoted end of said oscillatory member.

2. In a platen-bed press, the combination of two frames mounted for relative movement towards and away from each other, of a printing couple comprising a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis transverse to the direction of such relative movement between said frames, means pivotally mounting one end of one member of said printing couple on its supporting frame for oscillation about a fixed axis on said frame lying parallel with such first named axis, retractible means normally positioning the free end of said pivoted member to have initial contact with its cooperating member as the said

frames are moved together, one member of said printing couples being reciprocable relatively to its supporting frame in a direction transverse to said first named axis, and means for moving said reciprocable member on its supporting frame as said frames are brought together whereby said members engage in progressive rolling contact as such members are thus brought together.

3. In a platen-bed press, the combination of two frames mounted for relative movement towards and away from each other, a printing couple comprising a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis transverse to the direction of such relative movement between said frames, means pivotally mounting the end of one member of said printing couple on its supporting frame for oscillation about a fixed axis lying parallel with such first named axis, the other member of said printing couple being reciprocable relatively to its supporting frame in a direction transverse to said first named axis, means for moving said reciprocable member on its supporting frame as said frames are moved together, and retractible means normally positioning the free end of said pivoted member to have initial contact with its cooperating member when said frames are moved together, such contact thereupon progressively continuing toward the pivoted end of said pivoted member as said movement continues.

4. In a bed-platen press, the combination of a stationary frame and a second frame movably mounted with respect thereto, means for moving said second frame toward and away from said stationary frame, a bed member supported by said stationary frame and a platen member carried by said second frame, the operative face of said platen member being convexly curved on an arc of comparatively large radius about an axis transverse to the direction of movement of said second frame, said bed member mounted for reciprocatory movement on said stationary frame in a direction transverse to said axis, a pivot connecting one end of said platen member to its supporting frame to permit swinging movement of said platen member on a fixed axis lying parallel with such first named axis, retractible means to normally position the free end of said platen to have initial contact with said bed member as the said second frame is moved toward said stationary frame, said retractible means permitting the free end of said platen to yield upon contact between said platen and bed members as said movement continues, whereby rolling contact between said platen and bed occurs throughout said movement, and means for moving said bed member on its stationary frame as said platen is initially brought in contact therewith.

5. In a platen-bed press, the combination of two frames pivotally mounted for relative swinging movement toward and away from each other about a fixed axis, of a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis parallel with such first named axis, means pivotally mounting one end of one member of said members on its supporting frame for oscillation about a fixed axis on said frame lying parallel with said respective axes, retractible means normally positioning the free end of said pivoted member to have initial contact with its cooperating member as the said frames

are moved together, means mounting one of said members for translatory movement relative to the other member in a direction transverse to said respective axes upon said frames swinging toward and away from each other about said first named axis, means for swinging said frames toward and away from each other, and cooperating means on said respective frames responsive to said swinging movement to effect said translatory movement in progressive rolling contact between said members as they are brought together.

6. In a platen-bed press, the combination of two frames mounted for relative movement toward and away from each other, a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis transverse to the direction of such relative movement between said frames, means pivotally mounting one end of one member of said printing couple on its supporting frame for oscillation about a fixed axis on said frame lying parallel with such first named axis, retractible means normally positioning the free end of said pivoted member to have initial contact with its cooperating member as the same frames are moved together, means mounting one member of said printing couple for translatory movement relative to the other member in a direction transverse to said first named axis, means moving said frames toward and away from each other, and means responsive to said frame moving means for effecting said translatory movement of said member as said frames are brought together, whereby said members engage in progressive rolling contact as such members are thus brought together.

7. In a platen-bed press, the combination of two frames mounted for relative movement toward and away from each other, a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about on axis transverse to the direction of such relative movement between said frames, means pivotally mounting one of said members on its supporting frame for oscillation about an axis on said frame lying parallel with such first named axis, retractible means normally positioning one end of said pivotally mounted member to have initial contact with its cooperating member as said frames are moved together, and means mounting one of said members for translatory movement relative to the other member in a direction transverse to said first named axis as said frames are moved relatively to each other, means moving said frames toward and away from each other, and means responsive to said frame moving means to impart said translatory movement, whereby the juxtaposed faces of said members engage in progressive rolling contact as said members are thus brought together.

8. In a platen-bed press, the combination of two frames pivotally mounted for relative swinging movement toward and away from each other about a fixed axis, a platen member and a bed member respectively supported by said frames, the operative face of one of said members being convexly curved on an arc of comparatively large radius about an axis parallel with such first named axis, means pivotally mounting one of said members on its supporting frame for oscillation about an axis on said frame lying parallel with such first named axis, retractible means

normally positioning one end of said pivotally mounted member to have initial contact with its cooperating member as said frames are moved together, means mounting one of said members for translatory movement relative to the other member in a direction transverse to said first named axis as said frames are oscillated relatively to each other, means moving said frames toward and away from each other, and means responsive to said frame moving means to impart said translatory movement, whereby the juxtaposed faces of said members engage in progressive rolling contact as said members are thus brought together.

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