

June 15, 1937.

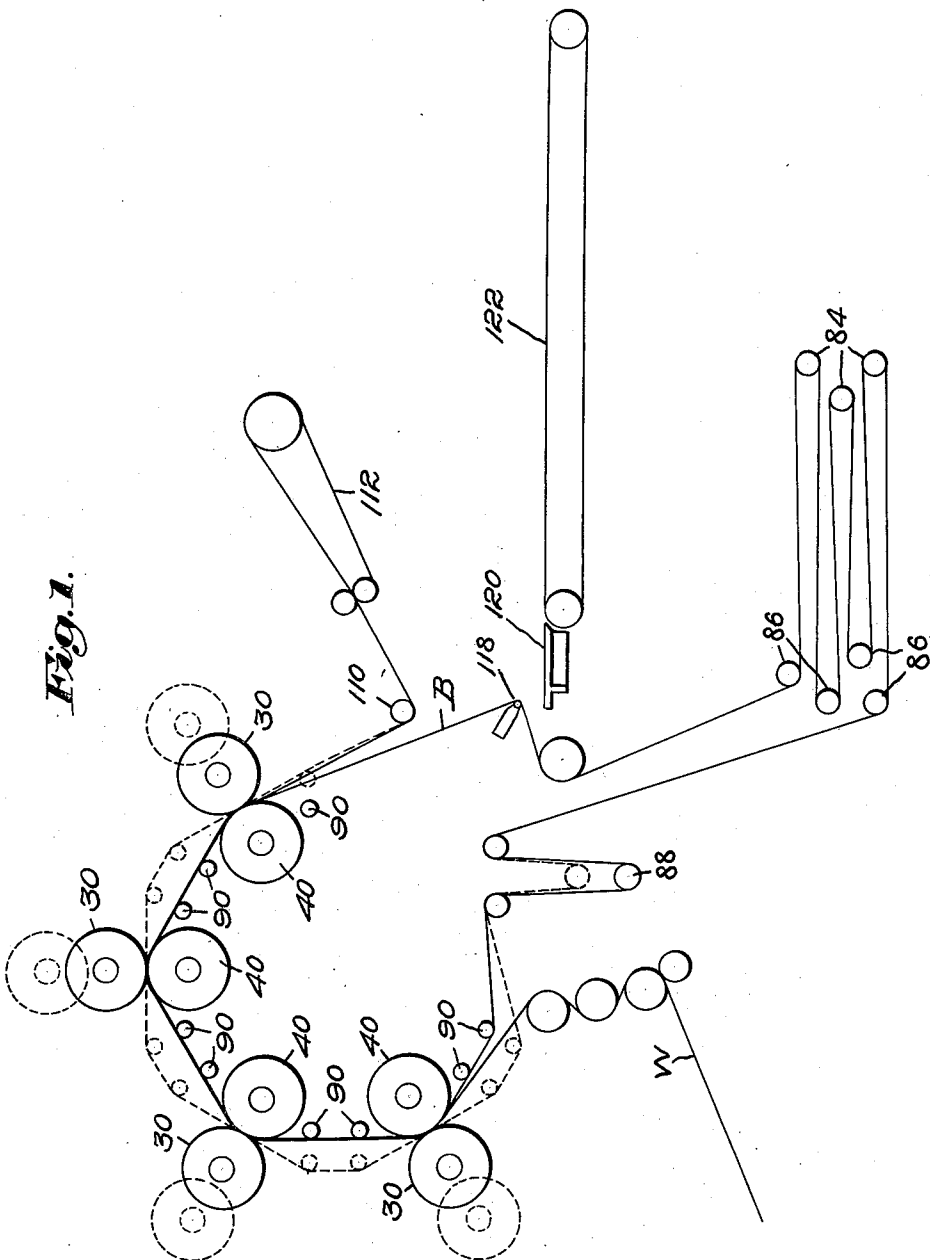
C. A. MEISEL

2,084,281

PRINTING PRESS

Filed Aug. 10, 1935

8 Sheets-Sheet 1



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8 Sheets-Sheet 2

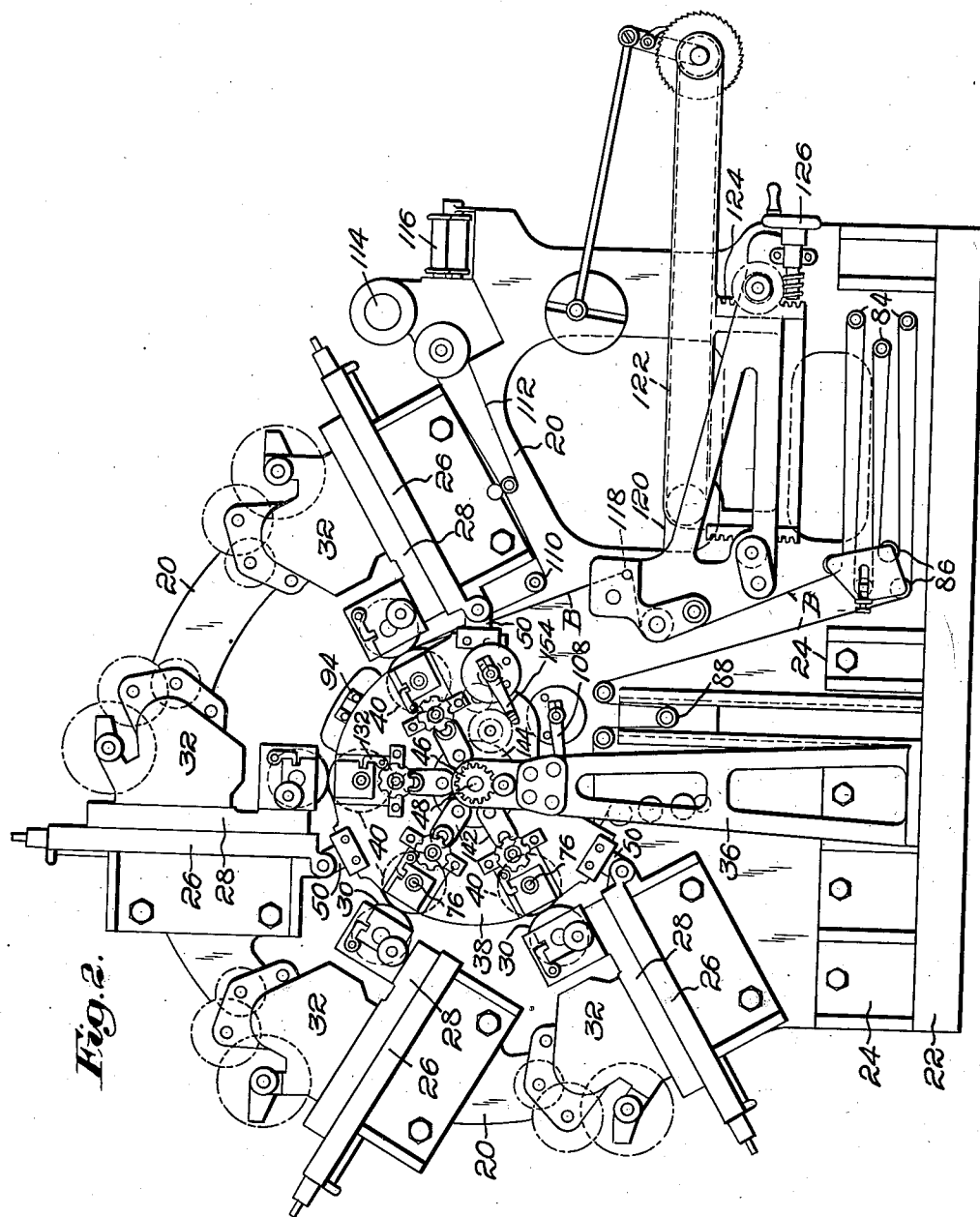


Fig. 2.

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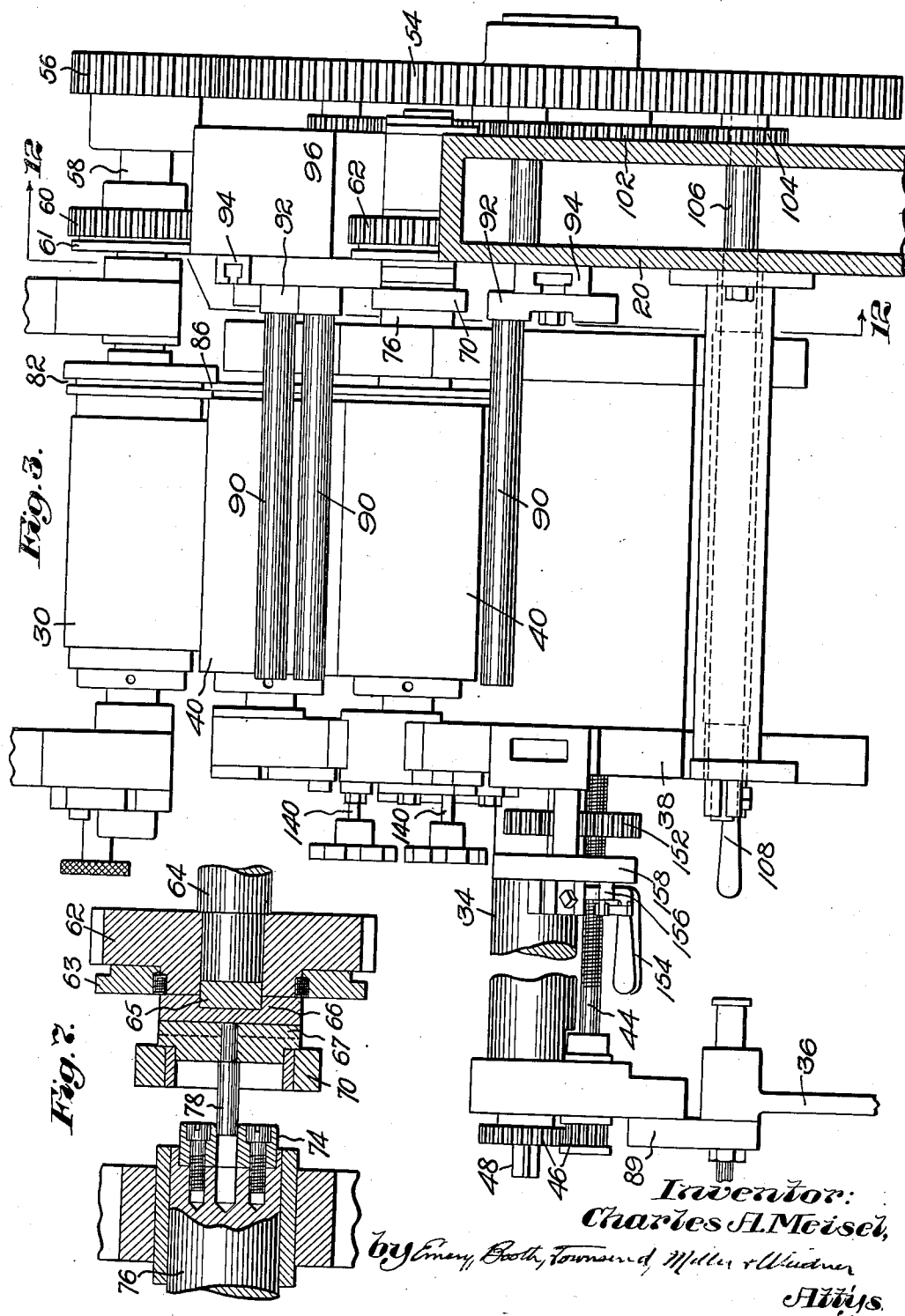
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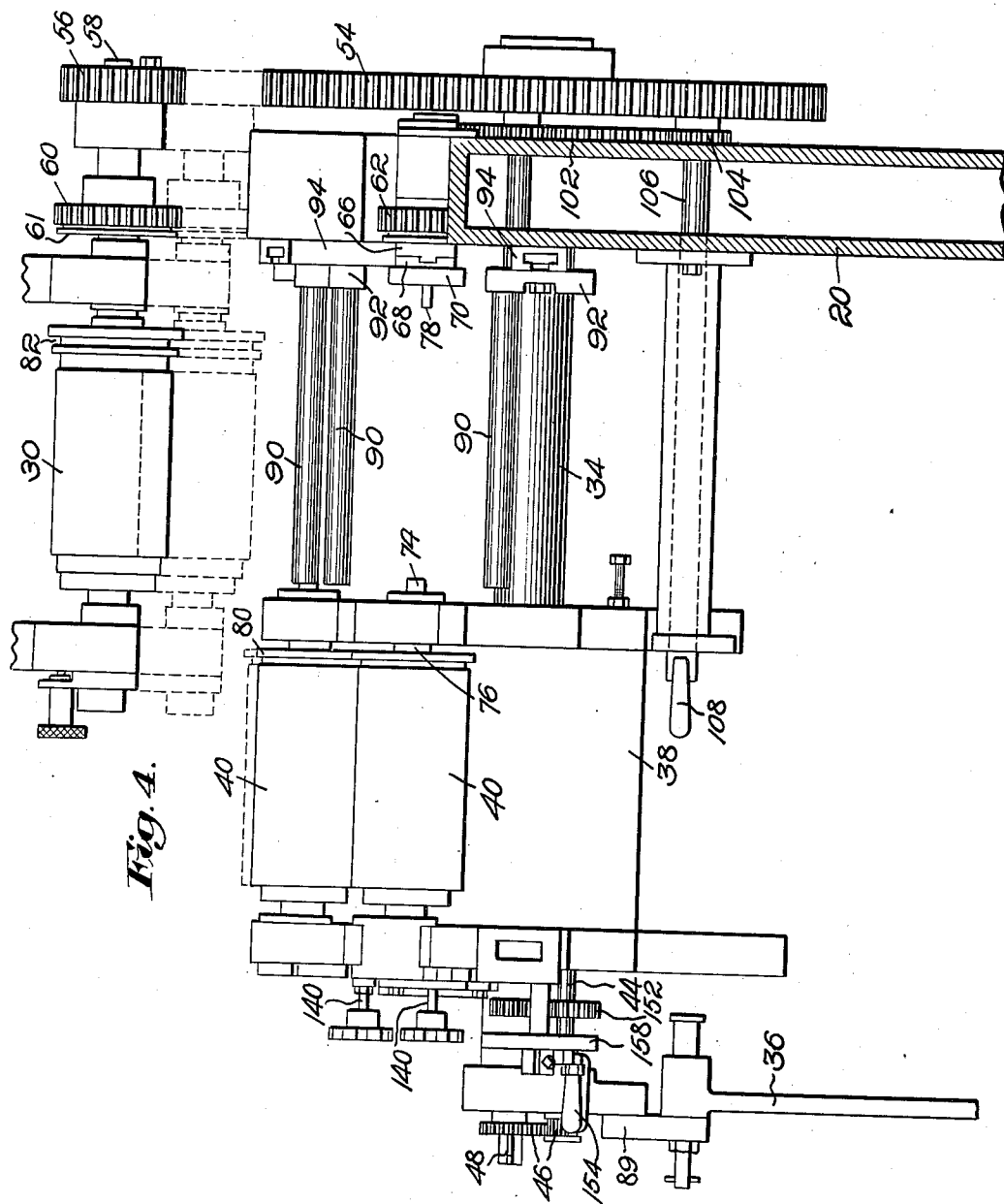
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8 Sheets-Sheet 4



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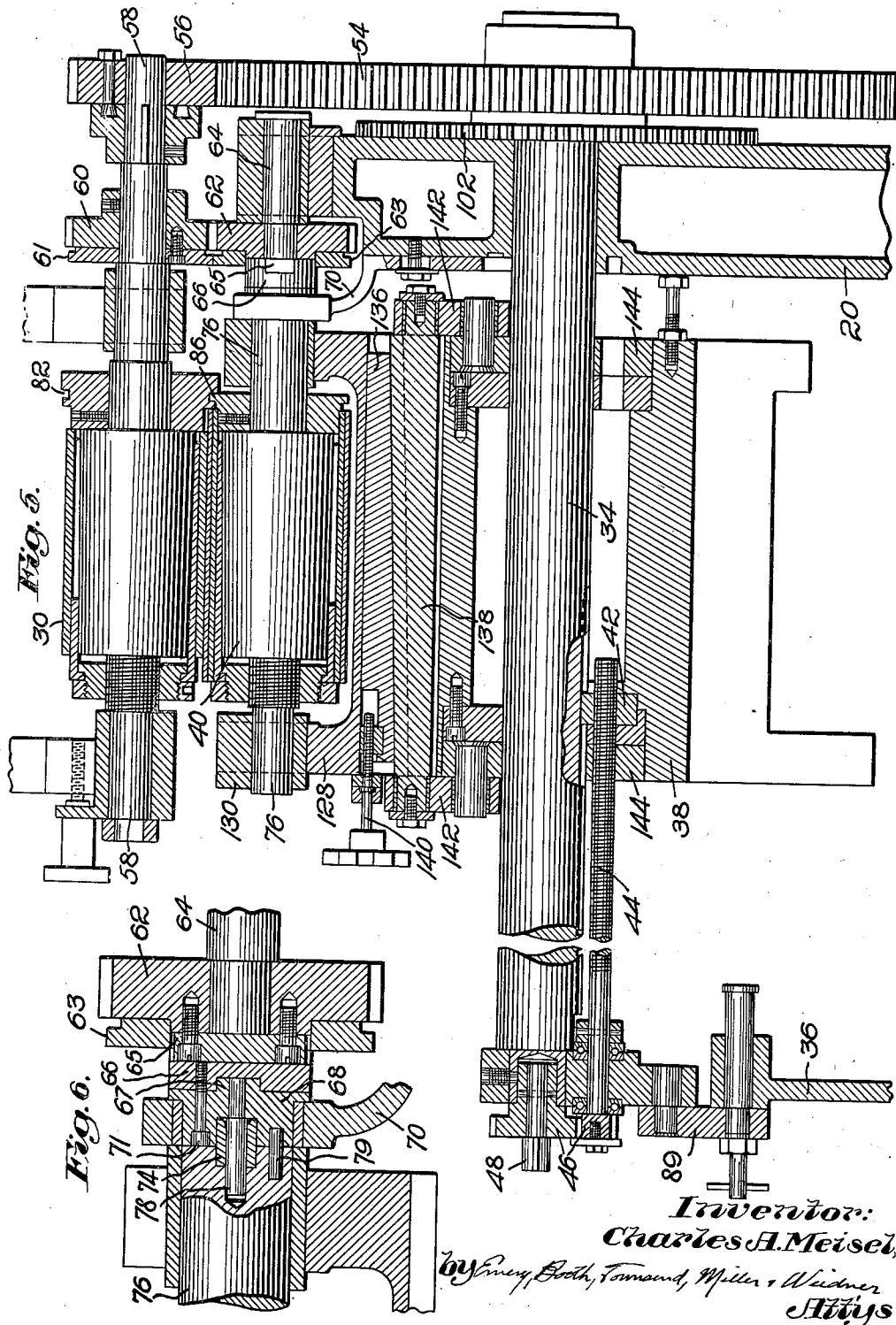
C. A. MEISEL

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8 Sheets-Sheet 5



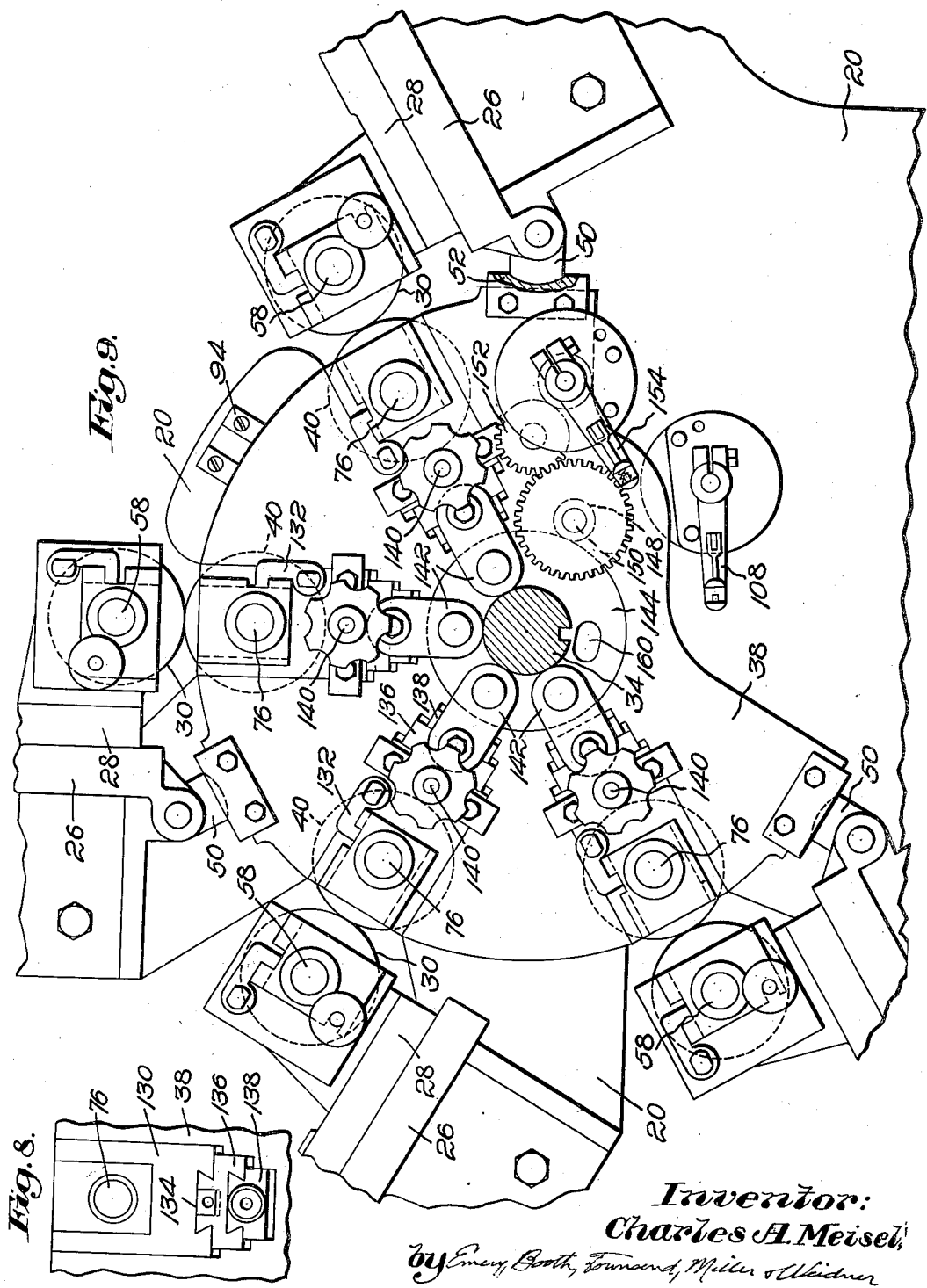
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8 Sheets-Sheet 6



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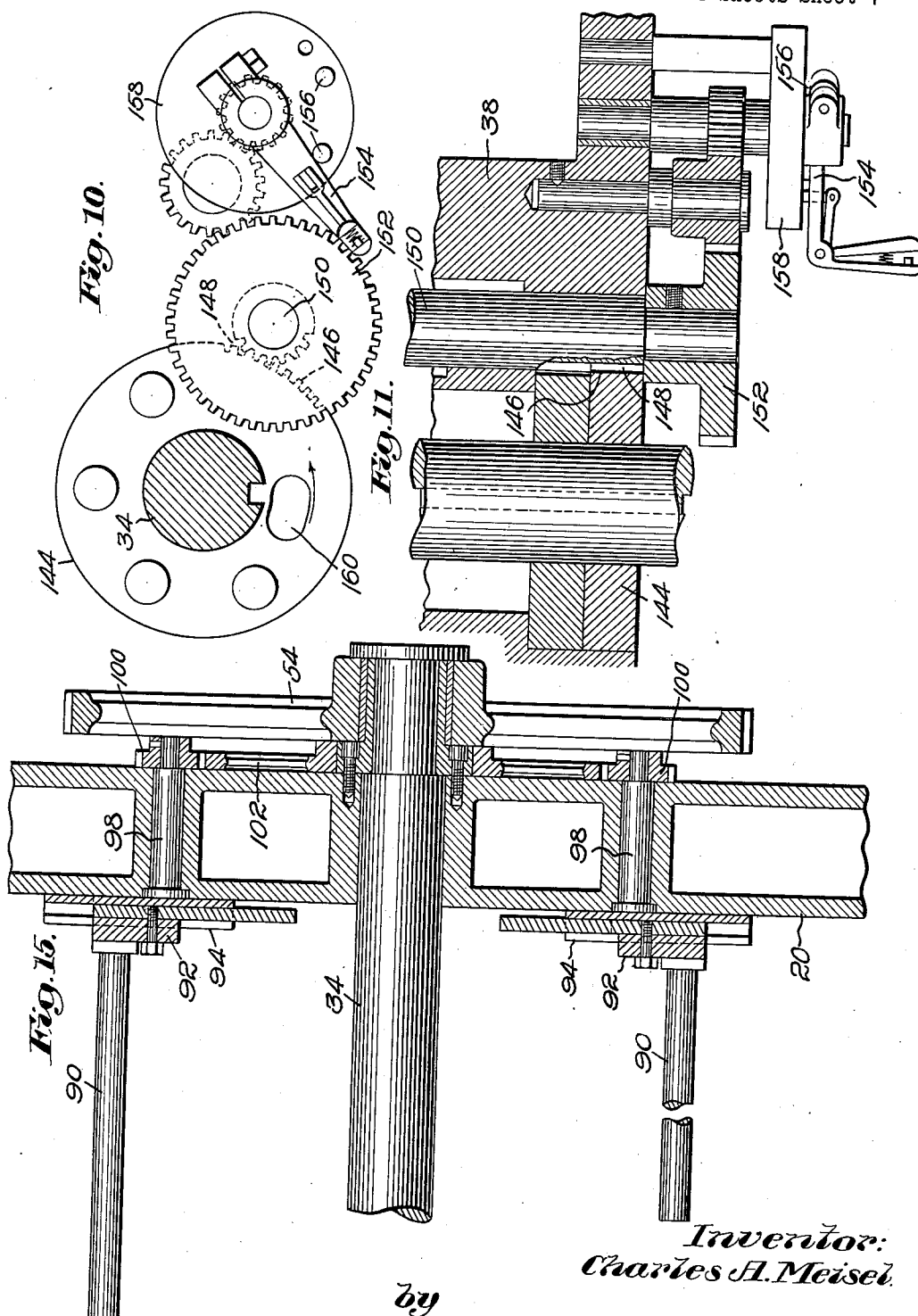
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8 Sheets-Sheet 7



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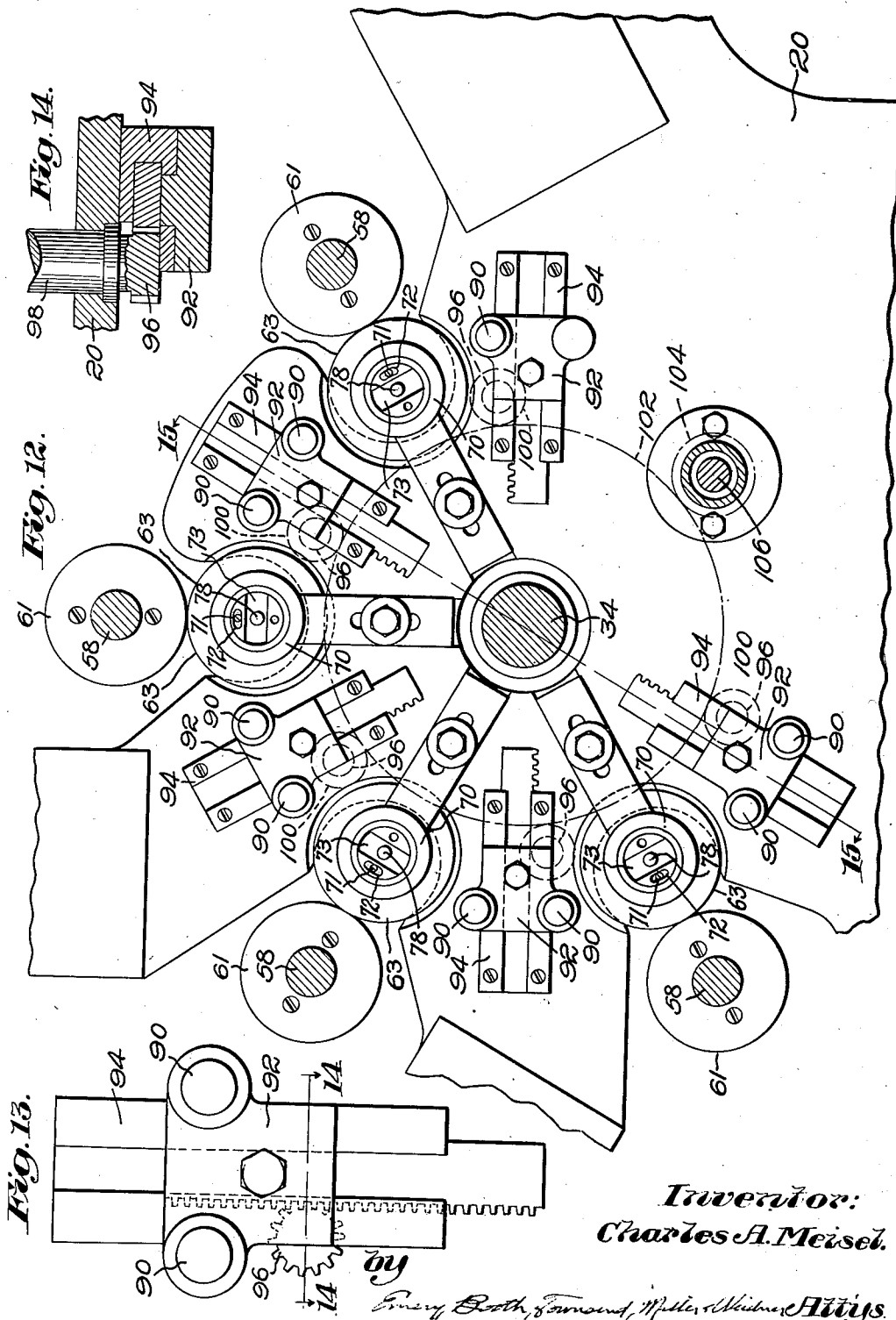
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8 Sheets-Sheet 8



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UNITED STATES PATENT OFFICE

2,084,281

PRINTING PRESS

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Application August 10, 1935, Serial No. 35,656

19 Claims. (Cl. 101—181)

This invention relates to multi-impression rotary printing presses, and while various features of the invention are of more general utility, the specific application thereof shown by way of example in the accompanying drawings is to a multi-couple web press specifically designed for printing multi-colored labels, so-called French edge labels, which may be embossed, and which are cut from the web as by means of a die forming part of the last printing surface. At the present time such labels are commonly printed on a rubber blanket by means of bed and platen presses at comparatively low speed. Herein I provide a high speed rotary press for performing the work embodying various features of convenience and efficiency as will appear to those skilled in the art by reference to the following description taken in connection with the accompanying drawings, wherein:—

- 20 Fig. 1 is a diagrammatic side elevation;
 - Fig. 2 is a side elevation of the press;
 - Fig. 3 is a fragmentary transverse section along a line corresponding to a portion of the path of the web through the couples and disclosing parts
 - 25 in end elevation as seen from the right of Fig. 2;
 - Fig. 4 is a similar view with parts in a different position of adjustment;
 - Fig. 5 is a partial transverse section along a radial line through one of the printing couples;
 - 30 Fig. 6 is a vertical section through the driving means for the impression cylinder as seen at the right of Fig. 5 and on an enlarged scale;
 - Fig. 7 is a similar section on a horizontal plane with the parts in a different position;
 - 35 Fig. 8 is an end view of the support for the impression cylinder as seen from the left of Fig. 5 but with parts omitted;
 - Fig. 9 is an enlarged side elevation of the central portion of the press;
 - 40 Fig. 10 is an enlarged detail of the gearing for actuating the throw-off mechanism which appears in Fig. 9;
 - Fig. 11 is a plan section of the same;
 - Fig. 12 is a vertical section on line 12—12 of
 - 45 Fig. 3 on an enlarged scale;
 - Fig. 13 is an enlarged elevation of parts shown in Fig. 12;
 - Fig. 14 is a section on the line 14—14 of Fig. 13; and
 - 50 Fig. 15 is a section on the line 15—15 of Fig. 12.
- Referring now to Fig. 2, the press shown is organized on a longitudinally extending frame 20 which may be supported from the base plate 22 by means of the gussets 24. In contrast with the

usual machine in which the parts are organized between two side frames of substantially similar construction, this single frame is the primary support of the mechanism and as such the machine may be characterized as having a substantially single frame. Brackets 26 are mounted 5 on the frame in overhung relation in a circular series and carriages 28 which support plate cylinders 30 and suitable inking mechanism 32 are adapted to be moved in and out along these brackets to adjust the plate cylinders radially 10 of the circle. I have deemed it unnecessary to illustrate and describe the details of the parts carried by the carriages as these may be of any usual or suitable construction.

Extending from the frame 20, as perhaps best 15 seen in Fig. 5, is a central stationary shaft 34 of a length roughly twice the width of the printing mechanisms of the press. The outer end of this shaft may rest (see Figs. 2, 3 and 4) in a pedestal 36 which, as clearly seen from Fig. 2, 20 is of restricted size so as to leave the nearer ends of the cylinders and the space within the same substantially unobstructed by frame parts. Mounted on this shaft (Figs. 3, 4 and 5) is a sub-frame 38 on which are supported, herein by means 25 more fully to be hereinafter described and in radial planes corresponding to the planes of the plate cylinders 30, impression cylinders 40. The sub-frame 38 (Fig. 5) may be splined to shaft 34 by means of the key 42 and is engaged by 30 screw 44 journaled in pedestal 36 and adapted to be driven through gears 46 by means of a hand crank applied to hub 48. By means of this the sub-frame 38 with the impression cylinders may be withdrawn to the left in Figs. 3 and 4 35 from the position in the former figure, in which the impression cylinders and the plate cylinders oppose each other, to the position of Fig. 4 wherein the impression cylinders are exposed at the side of the press. This renders the cylinders particularly accessible for changing or for purposes of make-ready and provides for other advantages which will appear as the description 40 proceeds.

When the sub-frame 38 is in the position of 45 Fig. 3 and the press in condition for running I may provide a support for the outer ends thereof, here illustrated (see Figs. 2 and 9) as consisting of three rotary lugs or latches 50 on certain of the brackets 26 adapted to be turned to enter 50 suitable recesses 52 provided in the sub-frame, as best illustrated at the right of Fig. 9. The brackets and the sub-frame thus give one another a mutual centralizing support and the legs 50 also maintain the sub-frame 38 in its inner position. 55

Referring to Fig. 5, the cylinders of the press are driven from a main drive gear 54 meshing with planet pinions 56 secured to the shafts 58 of the plate cylinders 30. These shafts also carry inwardly of frame 20 pinions 60 associated with bearers 61 which respectively drive pinions 62 and cooperate with bearers 63, both on shafts 64 journaled in the frame 20 and from which the impression cylinders are adapted to be driven. To permit the movement of the impression cylinders axially as hereinbefore described, their connection to the driving shaft 64 is by means of a suitable longitudinally separable clutch more fully illustrated in Figs. 6 and 7. There is herein mounted on the pinion a rectangular key 65 adapted to be received within a diametral slot in a clutch member 66, which member is provided with a slot at right angles to the first receiving a rectangular key 67 projecting from a cooperating clutch member 68 journaled in a bracket 70 secured to frame 20, as best seen in Fig. 5. A bolt 71 (Fig. 6) working in a slot 72 (Fig. 12) in clutch member 68 holds the two members 68 and 66 together while permitting their relative movement lengthwise of key 67. The other face of clutch member 68 is provided with a diametral slot 73 adapted to receive a key 74 secured to the end of shaft 76 of the impression cylinder. A central pin 78 projecting from the clutch member may enter a bore in the shaft, as best seen from Fig. 7, to guide the parts. When the sub-frame 38 with the impression cylinder on its shaft 76 is moved toward the left, viewing Figs. 5, 6 and 7, the shaft may move away from its fixed driving connection, as illustrated in Fig. 7, but when returned is clutched thereto so that the cylinders of the printing couple rotate in unison in the ordinary manner. An eccentrically positioned pin 79 (Fig. 6) carried by one of the parts 68 and 76 and entering an opening in the other provides for the connection of these two parts in the proper angular position as otherwise it would be possible to engage the parts in two different positions 180° apart. The keys 65 and 67 have a certain freedom of movement in their slots providing for a slight disalignment of the parts, the connection being essentially what is known as an Oldham coupling. In the operating position of the cylinders an annular bearer disc 80 on the impression cylinder may be received in a groove 82 on a bearer disc at the inner end of the plate cylinder, maintaining the aligned position of the two cylinders, and this engagement may be released when it is desired to withdraw the frame 35 of the impression cylinders either by tripping the latter inwardly in the manner hereinafter described or by retracting the plate cylinders radially outward.

In the printing process for which the press illustrated is especially intended the printing is effected against a rubber blanket B (Figs. 1 and 2) which is trained as an endless belt through the couples and it will be apparent that the unobstructed opening at the front side of the press, viewing Fig. 2, due to the overhung mounting of the parts and the movable mounting of the impression mechanism carried by sub-frame 38 facilitates the introduction of this blanket. The blanket is of considerable length and is here shown as trained through the several couples and around various guide rollers not necessary to specifically identify and as looped back and forth around stationary rollers 84 and rollers 85 mounted on an adjustably movable frame (Fig. 2) and over a dance roll 88. The adjustment of the frame-carrying rollers 86 through a given dis-

tance, of course, provides for taking up or letting off, in the present instance, slack in six times greater amount, while the dance roll keeps the blanket taut. The pedestal 35, as best shown in Figs. 3, 4 and 5, may be provided with a movable gate 89 to permit the insertion of the endless blanket in encircling relation about shaft 34.

To provide for the positioning of the blanket with the impression mechanism withdrawn and to support it in its approximate path through the printing couples when the impression mechanism is withdrawn for any reason I may provide between the successive couples (Figs. 1, 3, 4 and 15) supports in the form of posts 90 projecting in overhung relation from bases 92 mounted to slide (Figs. 12 to 14) in substantially radial ways 94 mounted at the inner side of frame 20. The bases 92 are formed with rack teeth with which mesh pinions 96 on pinion shafts 98 projecting through the frame where they carry at the rear side thereof pinions 100 adapted to mesh with a central gear 102. For rotating gear 102 a gear 104 (Figs. 12 and 3) may be provided which has a shaft 106 (Figs. 3 and 15) projecting to the nearer side of the press where it is provided with an actuating handle 108. Gear 104 may be turned by means of this handle and the supporting posts 90 reciprocated back and forth across the lines connecting the bites of the successive printing couples. Thus in the full line position of Fig. 2 the blanket B extends outwardly of these supports. They may, however, be shifted to the dotted line position carrying the blanket with them and taking up on the dance roll 88. The impression cylinders may now be drawn inwardly and moved outward from their position within the plate cylinders and the blanket will be maintained in position ready to receive the impression mechanism again within its circuit. Also in the preliminary positioning or replacement of the blanket it may be trained over these supports and moved out of the way in such manner as to permit the insertion within the same of the impression mechanism.

The web of paper W (Fig. 1) passes through the printing couples in the usual manner. In the case of labels, as herein described, during or at the end of the printing operation the printed areas are died out from the sheet, leaving a web of scrap as in a sheet of cookie dough. In this operation the cut-out portions are pressed against and adhere to the blanket B. The main body of the web, that is, the sheet of scrap, may be diverted over the guide roll 110 to a feeding out belt 112 and in the machine shown is chopped up along transverse lines by means of suitable cutting mechanism (not shown) carried on shaft 114 and delivered to the rapidly running, transversely located conveyor belt 116 (Fig. 2) to be disposed of. The blanket B with the adhering cut-out portions freed from the sheet of scrap continues in a different path and is bent sharply on itself about a suitable guide edge 118 and serves to disengage the labels therefrom so that they drop to table 120 with which is associated a feeding out belt 122, all mounted on a vertically adjustable frame 124 (Fig. 2) adapted to be raised or lowered by the hand wheel 126, this mechanism providing for the delivery of the product of the machine.

I will now describe the mechanism for tripping the impression cylinders, referring more particularly to Figs. 5, 8 and 9. The yokes 128 in which the boxes 130 in which the shafts 76 of the impression cylinders are journaled and in which they are retained by the latches 132 move in

suitable radial openings in the sub-frame 28 and are secured by a dovetailed connection 134 (Fig. 8) to an underlying support comprising an upper portion 136 and a lower portion 138 (Fig. 8), themselves connected by a dovetailed connection which, as best shown in Fig. 5, extends in a plane at an angle to the axial line of the cylinder. An adjusting screw 140 provides for longitudinally moving member 136 and thus provides for a fixed radial adjustment of the impression cylinder. The major or throw-off movement of the cylinder is effected by moving the support consisting of the two parts 136 and 138 bodily in and out to carry with it the yoke 130. For this purpose the part 138 has pivoted at either end thereof links 142, the inner ends of which are connected to discs 144 mounted for rotation within the sub-frame and provided (see Figs. 10 and 11) with gear teeth 146 along a segment thereof cooperating with segment gears 148 formed on shaft 150 which carries gear 152 operated through a suitable gear train from handle 154. Handle 154 may be provided with suitable latching means to permit it to be maintained in one or another position on opposite sides of the pins 156 projecting from locking disc 158 mounted on the side of the sub-frame 38. It will be apparent, referring to Fig. 9, that if the handle 154 is moved to the right in that figure, the disc 144 will rotate counterclockwise, the outer ends of the links 142 will be drawn inwardly and the various impression cylinders 40 will be simultaneously and equally drawn radially inward to separate the same from the plate cylinders. The range of movement is indicated in Fig. 10 by the opening 160 in disc 144 which provides for the passage of screw 44.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A multi-impression rotary press comprising a substantially single frame, brackets overhung therefrom and carrying a number of printing cylinders grouped about a center and each adjustable substantially radially to and from said center, an impression mechanism centrally arranged within the set of printing cylinders, the parts being exposed at the side remote from the frame.
2. A multi-impression rotary press comprising a substantially single frame, brackets overhung therefrom and carrying a number of printing cylinders grouped about a center and each adjustable substantially radially to and from said center, a shaft extending from said frame and beyond the printing cylinders, an impression mechanism carried by the shaft and movable therealong alternatively to cooperate with the printing cylinders or to be positioned outwardly beyond the same.
3. A multi-impression rotary press comprising a substantially single frame, brackets overhung therefrom and carrying a number of printing cylinders grouped about a center and each adjustable substantially radially to and from said center, a shaft extending from said frame and beyond the printing cylinders, an impression mechanism carried by the shaft and movable therealong alternatively to cooperate with the

printing cylinders or to be positioned outwardly beyond the same, and movable abutments carried by the distal ends of at least certain of said brackets adjustable to engage the distal portion of the impression mechanism in its inner position to contribute to the support of the same.

4. A multi-impression rotary press comprising a substantially single frame, circularly arranged brackets overhung therefrom and carrying radially adjustable printing cylinders, a central shaft extending from the frame, a post supporting the outer end of the shaft and an impression mechanism carried by the shaft, said post being out of alignment with the printing cylinders whereby the parts are substantially unobstructed at the side remote from the frame.

5. A multi-impression rotary press comprising a substantially single frame, circularly arranged brackets overhung therefrom and carrying radially adjustable printing cylinders, a central shaft extending from the frame and beyond the printing cylinders, a post supporting the outer end of the shaft and an impression mechanism carried by the shaft and movable therealong to permit it to be positioned outwardly beyond the printing cylinders, said post being out of alignment with the printing cylinders whereby the parts are substantially unobstructed at the side remote from the frame.

6. A multi-couple rotary press comprising a circularly arranged series of plate cylinders, a central shaft extending at one side beyond the plate cylinders, a frame carrying impression cylinders and movable along the shaft to expose the latter cylinders away from the plate cylinders.

7. A multi-couple rotary press comprising a circularly arranged series of plate cylinders, a central shaft extending at one side beyond the plate cylinders, a frame carrying impression cylinders and movable along the shaft to expose the latter cylinders away from the plate cylinders and driving means for the cylinders at the opposite end thereof including a clutch connection for the impression cylinders separable and engageable on the longitudinal movement of the frame.

8. A multi-couple rotary press comprising a circularly arranged series of plate cylinders, a central shaft extending at one side beyond the plate cylinders, a frame carrying impression cylinders and movable along the shaft to expose the latter cylinders away from the plate cylinders and driving means for the cylinders at the opposite end thereof including a clutch connection for the impression cylinders separable and engageable on the longitudinal movement of the frame, the drive to said impression cylinders being through Oldham couplings or their equivalent.

9. A multi-couple rotary press comprising a circularly arranged series of plate cylinders, a central shaft extending at one side beyond the plate cylinders, a frame carrying impression cylinders and movable along the shaft to expose the latter cylinders away from the plate cylinders and driving means for the cylinders at the opposite end thereof including a clutch connection for the impression cylinders separable and engageable on the longitudinal movement of the frame and means for latching said frame in its inward position.

10. A rotary press of the class described comprising a frame, plate cylinders mounted in overhung relation therefrom, cooperating impression cylinders, the contact lines of the couples being unobstructed by frame parts at their distal ends,

an endless blanket and means for positioning the same to circulate through the press.

11. A rotary press of the class described comprising a substantially single frame, plate cylinders overhung therefrom, a framework carrying cooperating impression cylinders having mountings so constructed and arranged as to permit them to be withdrawn away from the frame to a position out of line with the plate cylinders, and supports between the couples adjustable across the lines of connection between the couples and providing for the support of the blanket when the framework is withdrawn.
12. A rotary press of the class described comprising a substantially single frame, plate cylinders overhung therefrom, a framework carrying cooperating impression cylinders having mountings so constructed and arranged as to permit them to be withdrawn away from the frame to a position out of line with the plate cylinders, an endless blanket trained through the couples, supports extending in overhanging relation from the frame between the couples, and means operable from a single actuating device at the side of the press remote from the frame for simultaneously moving the supports across the lines of connection between the couples.
13. A multi-couple rotary press of the class described comprising a circularly disposed series of plate cylinders and means for supporting them defining an interior space substantially unobstructed at one side, a central framework carrying cooperating impression cylinders so constructed and arranged as to permit them to be withdrawn toward said side from between the plate cylinders, an endless blanket trained through the couples, and supports between the couples adjustable across the lines of connection between the couples and providing for the support of the blanket when the framework is withdrawn.
14. A multi-couple rotary press of the class described comprising a circularly disposed series of plate cylinders and means for supporting them defining an interior space substantially unobstructed at one side, a central framework carrying cooperating impression cylinders so constructed and arranged as to permit them to be withdrawn toward said side from between the plate cylinders, stripping means for moving the impression cylinders in and out on the framework, an endless blanket trained through the couples, and supports between the couples ad-

justable across the lines of connection between the couples and providing for the support of the blanket when the framework is withdrawn.

15. A multi-couple rotary press comprising a frame, supports for a circularly arranged series of plate cylinders carried thereby, there being a substantially unobstructed opening from one side of the press to the space between said plate cylinders, and a framework carrying cooperating impression cylinders movable axially in and out from said opening.

16. A multi-couple rotary press comprising a frame, supports for a circularly arranged series of plate cylinders carried thereby, there being a substantially unobstructed opening from one side of the press to the space between said plate cylinders, a central shaft extending from the other or further side of the press, a framework carrying cooperating impression cylinders movable along the shaft in and out from said opening, and means carried by said supports adjustable to engage the nearer end of said framework in its inner position to aid in supporting it.

17. A multi-couple rotary press comprising a frame, supports for a circularly arranged series of plate cylinders carried thereby, there being a substantially unobstructed opening from one side of the press to the space between said plate cylinders, an endless blanket, and means for training it through the couples comprising supports extending in overhanging relation from the other or further side of the press, means for moving the supports in and out across the lines connecting the points of contact of the couples, and a framework carrying cooperating impression cylinders movable in and out from said opening.

18. A multi-couple rotary printing press comprising a central framework, supports occupying positions therein corresponding to elements of a cylinder, boxes carried thereby, impression cylinders mounted in the boxes, a central ring, links secured to said supports and ring, and means for rotating the ring to trip the cylinders.

19. A multi-couple rotary printing press comprising a central framework, supports occupying positions therein corresponding to elements of a cylinder, boxes carried thereby, impression cylinders mounted in the boxes, said supports each being divided along a plane oblique to the cylinder axis, means for shifting one of the parts longitudinally for adjusting the cylinder, and means for shifting the support radially to trip the cylinder.

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