May 13, 1958 J. E. MEYER 2,834,290

INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

Filed June 26, 1953 6 Sheets-Sheet 1

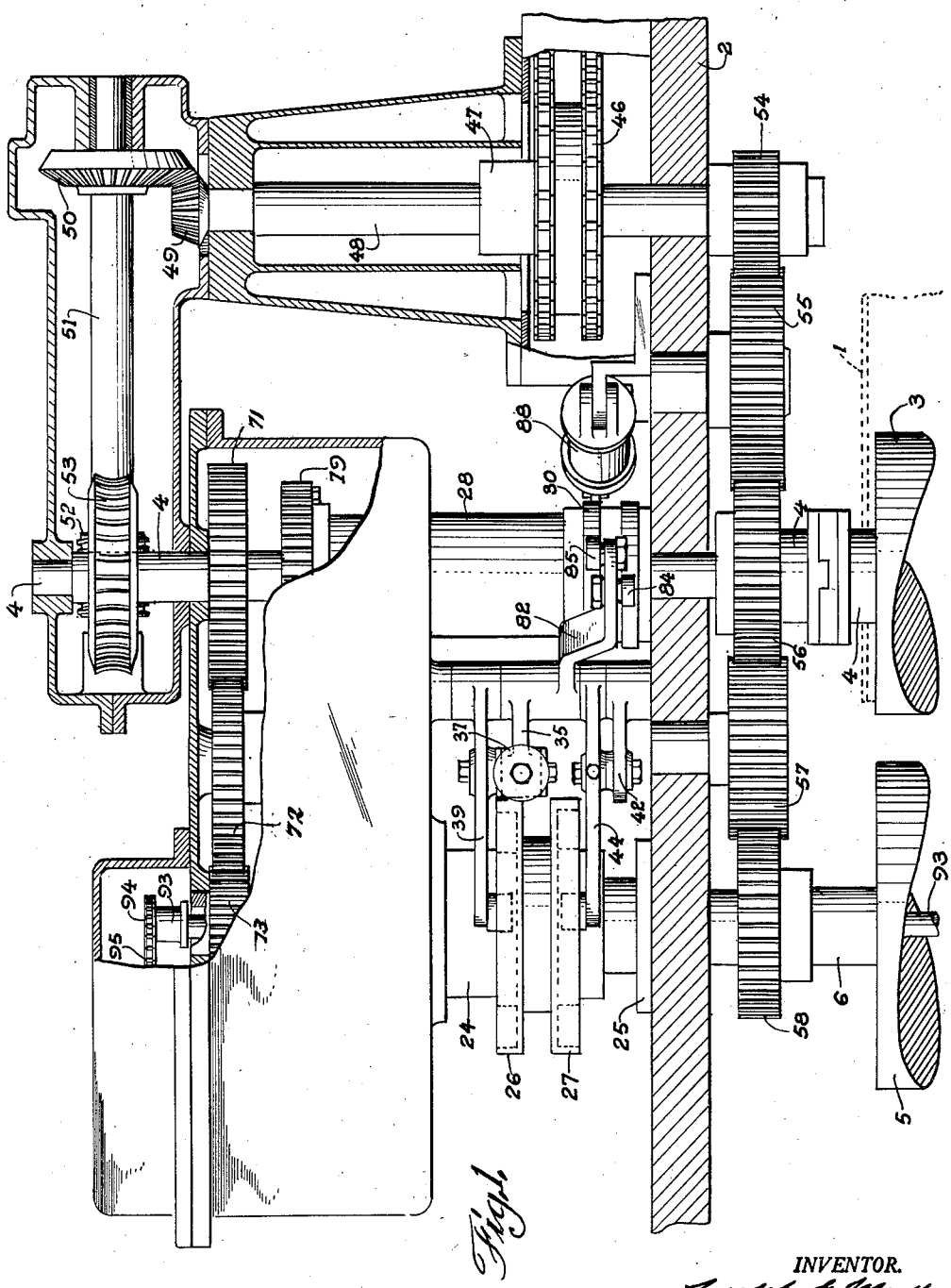

Fig. 1.

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INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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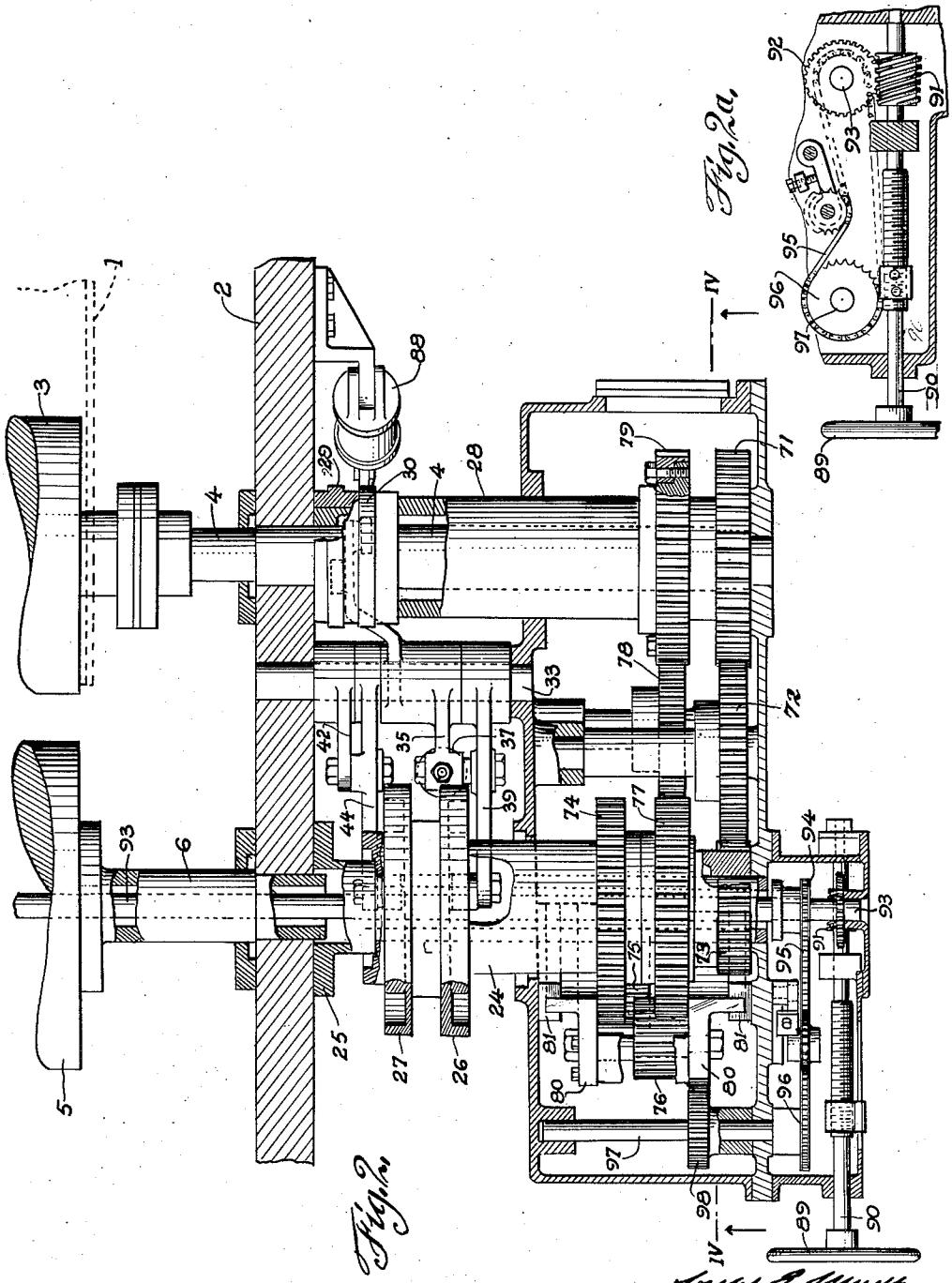

Fig. 2

Fig. 2a

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INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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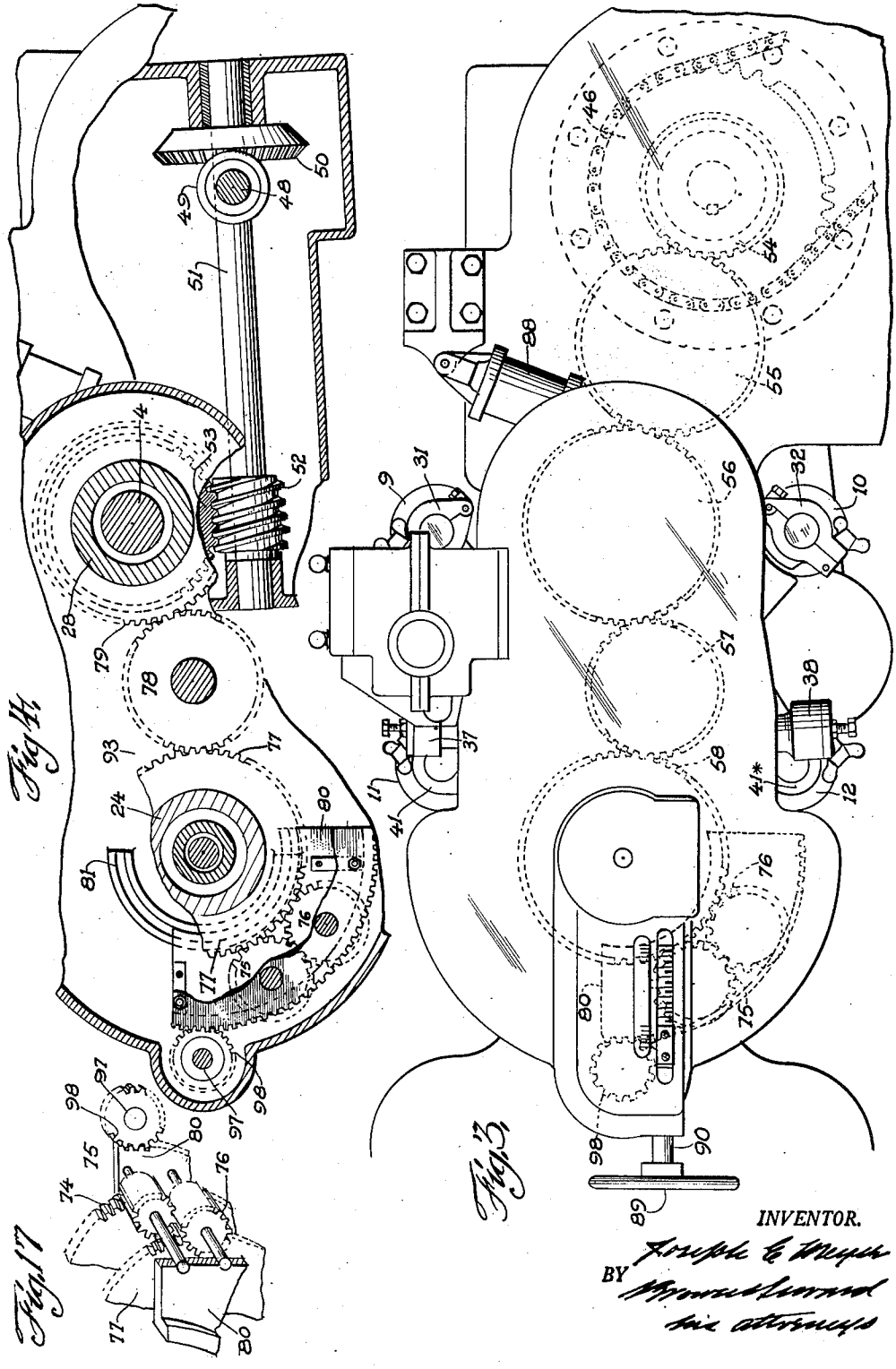

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INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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Fig. 10.

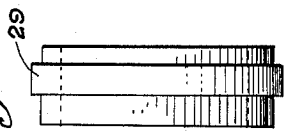


Fig. 9.

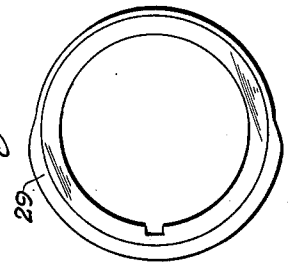


Fig. 8.

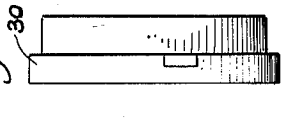


Fig. 7.

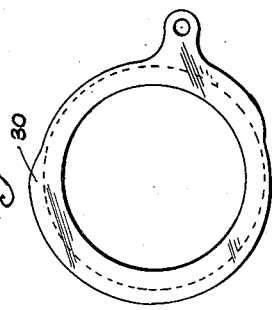


Fig. 6

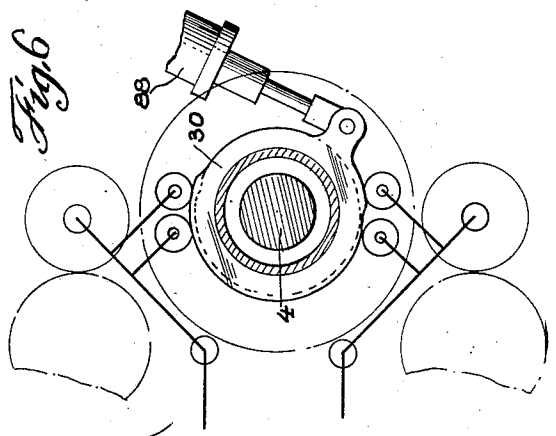
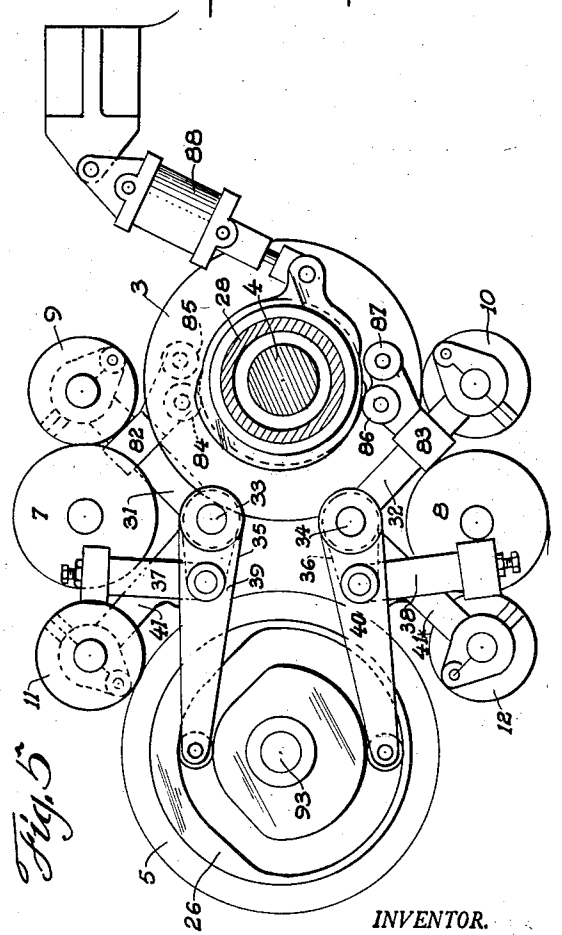


Fig. 5



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INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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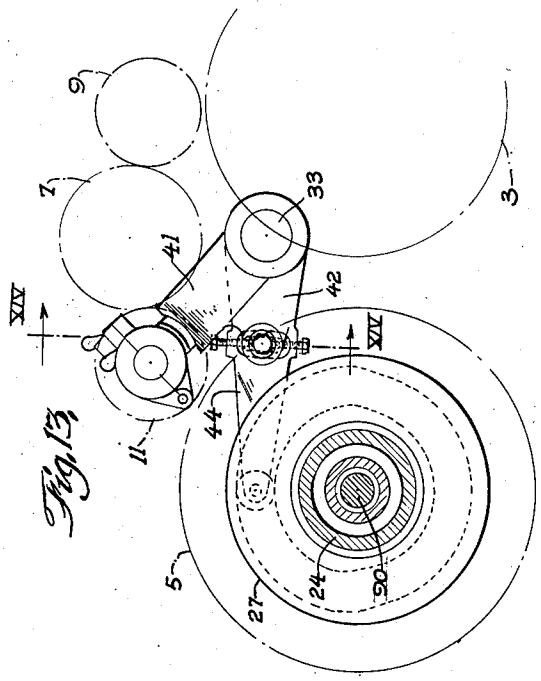

Fig. 13

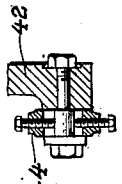

Fig. 14

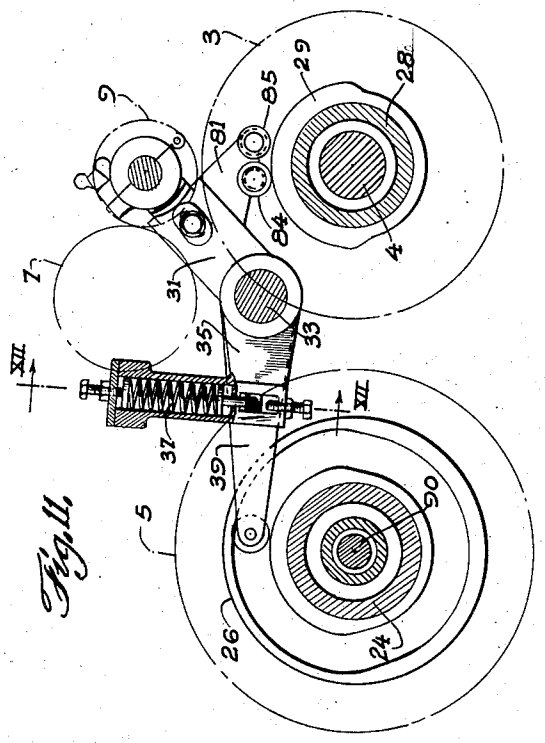

Fig. 11

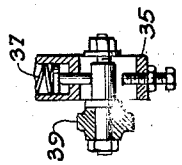

Fig. 12

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INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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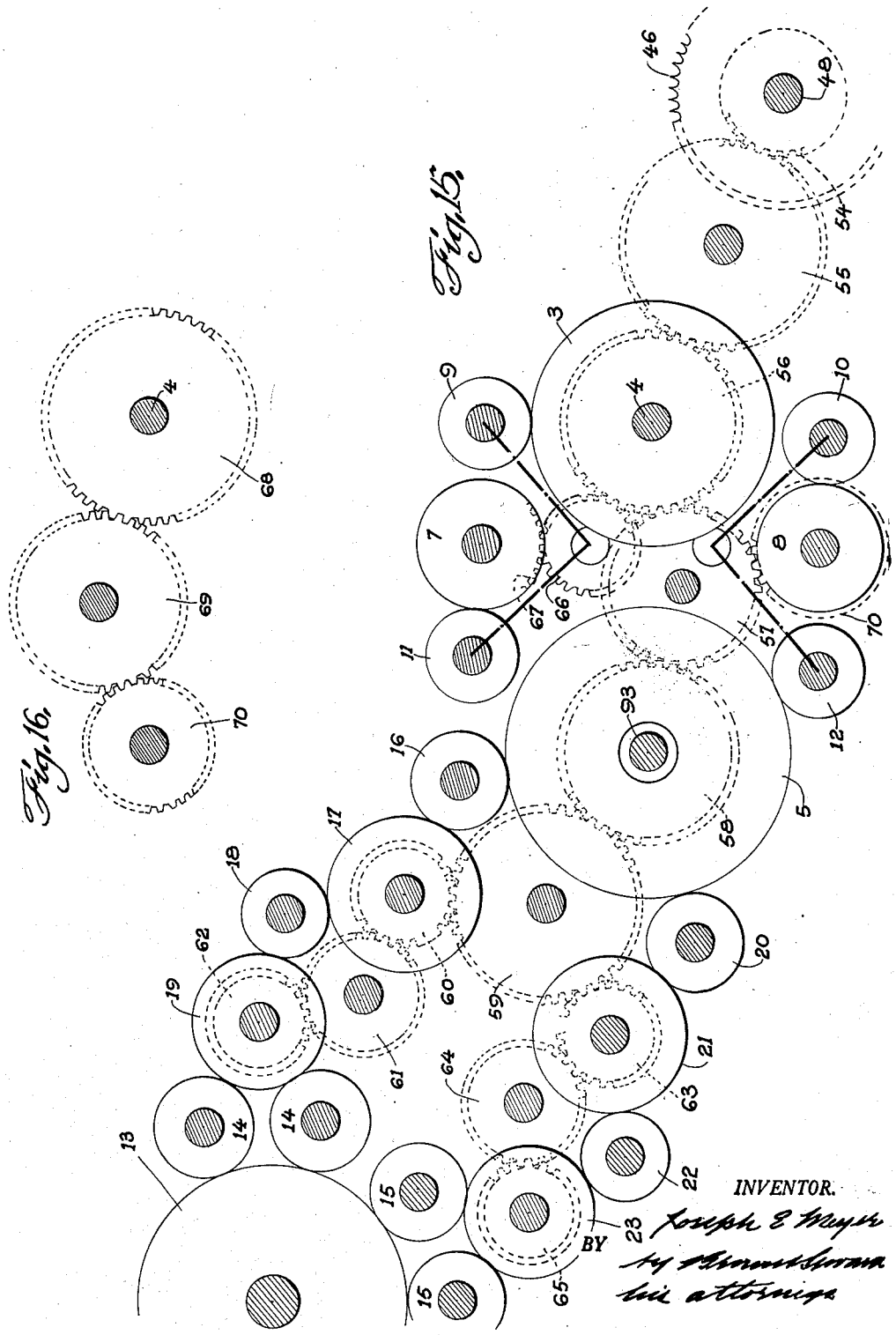

United States Patent Office 2,834,290 Patented May 13, 1958

2,834,290

INK DISTRIBUTIONS FOR ROTARY PRINTING PRESSES

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Application June 26, 1953, Serial No. 364,339

15 Claims. (Cl. 101—350)

This invention is directed to certain improvements in ink distributions for rotary printing presses, and especially high speed rotary printing presses.

One object of my invention is to provide novel means for adjusting the ink feed by varying the dwell of the ductors which oscillate to transfer the ink alternately from the ink fountain roll to their respective ink rolls.

Another object is to provide both main and auxiliary means for oscillating said ductors, means being employed to act through the auxiliary means for varying the dwell of the ductors on their ink fountain roll.

Another object is to provide rotary main cams and auxiliary cams driven thereby in unison therewith, for oscillating the fountain roll ductors, the means operating to alter the angular relationship of the auxiliary cams to their main cams for varying the said dwell of the fountain roll ductors on the fountain roll.

Another object is to provide an ink distribution for high speed rotary printing presses, which distribution includes a continuous low speed ink fountain roll, two low speed ink rolls, and a high speed ink drum; two oscillating ductors being provided for transferring the ink from the fountain roll to the low speed ink rolls, and two main ductors being provided for transferring the ink from said ink rolls to the high speed ink drum.

A further object is to provide a novel means for controlling the swinging movement of rocking segments included in the train of gears connecting the main ductor operating cams with their auxiliary cams.

A further object is to provide a novel throw-off mechanism to throw the fountain ductors away from their contact with the ink fountain roll and hold them in such position to completely stop the flow of ink when the press is tripped-off impression or for any other reason.

A practical embodiment of my invention is represented in the accompanying drawings in which:

Fig. 1 is a top plan view, partly in section, of the portion of the ink distribution adjacent one of the side frames with the low speed ink rolls and the ductors omitted;

Fig. 2 is a similar view of the portion of the ink distribution adjacent the other side frame;

Fig. 2*a* is a detail section showing, in another position, the hand wheel for altering the angular relationship of the auxiliary cams to their main cams;

Fig. 3 is a detail side view of the portion of the ink distribution which includes this invention;

Fig. 4 is a vertical longitudinal section taken in the plane of the line IV—IV of Fig. 2, looking in the direction of the arrows;

Fig. 5 is a detail side view, partly in section, showing the ink fountain roll, the ink drum, the upper and lower ink rolls, the upper and lower ductors which oscillate between the fountain roll and the said ink rolls, and the upper and lower ductors which oscillate between the ink rolls and the ink drum;

Fig. 6 is a detail section, partly in diagram, of one of the auxiliary cam shafts and its throw-off cam in

position to silence the upper and lower fountain roll contacting ductors;

Figs. 7 and 8 are front and side views, respectively, of one of the throw-off cams;

Figs. 9 and 10 are front and side views, respectively, of one of the auxiliary cams;

Fig. 11 is a longitudinal vertical section showing a main ductor operating cam, its auxiliary ductor operating cam and the yielding connection between one of the cam operated levers and its ductor lever;

Fig. 12 is a detail section taken on the line XII—XII of Fig. 11;

Fig. 13 is a longitudinal vertical detail section showing the unyielding connection between the main cam operated lever and its ductor lever;

Fig. 14 is a detail section taken in the plane of the line XIV—XIV of Fig. 13;

Fig. 15 is a diagrammatic view showing the complete ink distribution and the gears for driving the same from the main drive shaft;

Fig. 16 shows the train of gears between each fountain roll shaft and its main cam sleeve, and

Fig. 17 is a detail perspective view showing more clearly a part of the driving connection between a main cam sleeve and its auxiliary cam sleeve.

The ink fountain **1** is located between the side frames **2**. The low speed ink fountain roll **3** has its shafts **4** rotatably mounted in the side frames **2**. The high speed ink drum **5** has its hollow shafts **6** also rotatably mounted in the said side frames **2**. Upper and lower small slow speed ink rolls **7** and **8** are located intermediate and spaced from the fountain roll **3** and ink drum **5**.

A first pair of upper and lower ductors **9** and **10** oscillate between the fountain roll **3** and their respective upper and lower ink rolls **7** and **8**. A second pair of upper and lower ductors **11** and **12** oscillate between the said upper and lower ink rolls **7** and **8** and the ink drum **5**.

The form cylinder (shown in Fig. 15) is denoted by **13** and its upper and lower pairs of form inking rolls by **14** and **15** respectively.

An upper group of inking rolls **16, 17, 18, 19** lead from the ink drum **5** to the upper pair of form inking rolls **14**. A lower group of inking rolls **20, 21, 22, 23** lead from the said ink drum **5** to the lower pair of form inking rolls **15**.

Beyond each end of the ink drum **5** a main cam sleeve **24** is rotatably mounted on a supporting sleeve **25** fixed to and projecting from its adjacent side frame **2**. Two ductor operating main box cams **26** and **27** rotate with their sleeve **24**, the main cam **26** serving to oscillate the pair of ductors **9** and **10**, which oscillate between the fountain roll **3** and the upper and lower inking rolls **7** and **8**, and the main cam **27** serving to oscillate the ductors **11** and **12** between the said upper and lower ink rolls **7** and **8** and the ink drum **5**.

Beyond each end of the ink fountain roll **3** an auxiliary cam carrying sleeve **28** is rotatably mounted on its fountain roll shaft **4**. An auxiliary cam **29** is fixed to rotate with its sleeve **28** in unison with the main cams **26** and **27**, which auxiliary cam **29** is also used to oscillate the pair of upper and lower ductors **9** and **10**.

A ductor throw-off cam **30** is rotatably mounted on each of the sleeves **28**.

The upper and lower ductors **9** and **10** are carried by ductor levers **31** and **32** respectively, mounted to rock on upper and lower stud axles **33** and **34**, the arms **35** and **36** of which rock levers are yieldingly connected by spring means **37** and **38** to the cam operated rock levers **39** and **40**. These rock levers are also mounted on the stud axles **33** and **34**, and are operated by the main cam **26**.

The upper and lower ductors **11** and **12** are carried by

ductor rock levers 41 and 41* also mounted on the upper and lower stud axles 33 and 34, which rock levers are provided with arms 42 and 43 fixed to rock with the cam operated rock levers 44 and 45, also mounted on the stud axles 33 and 34. These cam rock levers 44 and 45 are operated by the other main cam 27 on the rotary cam sleeve 24.

The main drive for the ink distribution is shown as including the following elements: a sprocket wheel 46 may be driven at the desired speed from the press and it is connected through a clutch 47 to the cross-drive shaft 48. The outer end of this shaft 48 has a bevel gear connection 49, 50 with a shaft 51, which in turn has a worm and gear connection 52, 53 with one of the ink fountain roll shafts 4 to drive the fountain roll 3 at the desired low speed.

The inner end of the drive shaft 48 is provided with a gear 54 which drives the ink drum 5 at the desired high speed through the train of gears 55, 56, 57, 58, the gear 56 being rotatably mounted on the ink fountain roll shaft 4.

The rest of the ink distribution (see Fig. 15) is shown as driven from the gear 58 through the common gear 59, the upper group of gears 60, 61, 62, and the lower group of gears 63, 64, 65.

The upper low speed ink roll 7 is shown as driven at the desired low speed through the gears 66, 67, and the lower speed ink rolls 8 are shown as driven at the same desired low speed through the gears 57, 70.

Each main cam carrying sleeve 24 is driven at the desired speed from the fountain roll shaft 4 through the gears 71, 72, 73.

Each auxiliary cam sleeve 28 is driven from and in unison with its main cam sleeve 24 through the following train of gears: a sun gear 74, which is fast on the main cam sleeve 24, driving the gear 79 on the auxiliary sleeve 28 through the train of gears 75, 76, 77, 78. The gears 75 and 76 of this train are mounted on the rocking gear segment 80, which segment is guided by an arcuate track 81.

The upper and lower ductor levers 31 and 32 carry brackets 82 and 83, on which are mounted the cam rollers 84, 85 and 86, 87. The upper and lower cam rollers 84 and 86 are operated by the rotary auxiliary cam 29 of each cam sleeve 28, and the upper and lower cam rollers 85 and 87 are operated by the throw-off cams 30, loosely mounted on each of the said auxiliary cam sleeves 28. Both of these throw-off cams 30 may be rocked in unison by any suitable means, as for instance, air cylinders 88.

The means for adjusting the ink feed for altering the angular relationship of the auxiliary cams 29 to their main cams 26, to vary the dwell of the upper and lower ductors 9 and 10 on the ink fountain roll 3, may be constructed, arranged and operated as follows.

A hand wheel 89 is provided with a shaft 90 which has a worm and wheel connection 91 and 92 with a cross shaft 93, which leads from side to side of the ink distribution axially through the main cam sleeves 24, the ink drum 5 and its shafts 6. A sprocket wheel 94 fast on each end of said cross shaft 93 is connected by a chain 95 to a sprocket wheel 96 fast on a short cross shaft 97. This cross shaft 97 is provided with a pinion 98 which meshes with the teeth on the gear segment 80, which carries the two intermediate gears 75, 76 of the gear train between the main cam sleeve 24 and its auxiliary cam sleeve 28.

It will be seen that a turn of the hand wheel 89 will rock the segment 80 and thus alter the angular relationship of the auxiliary cam 29 to its main cam 26, without affecting the unitary speed of the said cams.

It will also be seen that by changing the dwell of the upper and lower ductors 9 and 10 on their fountain roll 3, the supply of ink may be varied from zero to a predetermined maximum.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention; and hence I do not intend to be limited to the particular embodiment herein shown and described.

What I claim is:

1. In an ink distribution for rotary printing presses, a continuous speed ink fountain roll, two ink rolls, two ductors, rocking supports therefor, two rotary main cams for oscillating the ductors between the ink fountain roll and the ink rolls, two auxiliary cams for also oscillating said ductors, means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll, throw-off cams rotatably mounted on the axis of the auxiliary cams, and means for turning said throw-off cams to cause them to hold the said ductors out of contact with the ink fountain roll.

2. In an ink distribution for rotary printing presses, a continuous speed ink fountain roll, two ink rolls, two ductors, rocking supports therefor, two alined rotary sleeves, two rotary main cams thereon for oscillating the ductors between the ink fountain roll and the ink rolls, two alined rotary auxiliary cam sleeves, two auxiliary cams thereon for also oscillating said ductors, means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll, throw-off cams rotatably mounted on the auxiliary cam sleeves in position to engage the ductor supports, and means for turning said throw-off cams to cause them to hold the said ductors out of contact with the ink fountain roll.

3. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls, located between and spaced from the fountain roll and ink drum, two pairs of upper and lower ductors, four rotary main cams on the axis of the ink drum, yieldingly connected rock levers operatively connecting two of the main cams to one of the pairs of ductors for oscillating them between the ink fountain roll and the ink rolls, rock levers operatively connecting the other two main cams to the other pair of ductors for oscillating them between the ink rolls and the ink drum, two rotary auxiliary cams located on the axis of the fountain roll and rotating in unison with the main cams and operatively connected to the first pair of upper and lower ductors, and means for altering the angular relationship of the auxiliary cams to their main cams, to vary the dwell of the first pair of upper and lower ductors on the ink fountain roll.

4. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls, located between and spaced from the fountain roll and ink drum, four rotary main cams located on the axis of the ink drum, first and second pairs of upper and lower ductors, yielding means operated by two of said main cams for oscillating the first pair of the ductors between the ink fountain roll and the ink rolls, means operated by the other two main cams for oscillating the second pair of ductors between the ink rolls and the ink drum, two rotary auxiliary cams located on the axis of the fountain roll for oscillating the first pair of ductors, gearing operatively connecting said main and auxiliary cams to rotate them in unison, and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the first two ductors on the fountain roll.

5. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls, located between and spaced from the fountain roll and ink drum, two rotary main cams located on the axis of the ink drum at each end thereof, first and second pairs of upper and lower ductors, means operated by the first pair of said main cams for oscillating two of the ductors

between the fountain roll and the ink rolls, means operated by the other two main cams for oscillating the other second pair of ductors between the ink rolls and the ink drum, two rotary auxiliary cams located on the axis of the fountain roll for oscillating the first pair of ductors, gearing including rocking elements and intermediate gears carried thereby, operatively connecting said main and auxiliary cams to rotate them in unison, and means operating through said rocking elements for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the first two ductors on the fountain roll.

6. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls located between and spaced from the fountain roll and ink drum two pairs of upper and lower ductors, four rotary main cams located on the axis of the ink drum, cam operated rock levers and ductor rock levers yieldingly connected thereto, for oscillating one pair of the ductors between the ink fountain roll and the ink rolls, two other cam operated rock levers and ductor rock levers operatively connected thereto for oscillating the other pair of ductors between the ink rolls and the ink drum, two rotary auxiliary cams on the axis of the fountain roll and rotating in unison with their main cams, and operatively connected to the first pairs of ductors, and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the first two ductors on the ink fountain roll.

7. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls located between and spaced from the fountain roll and ink drum, two pairs of upper and lower ductors, rocking supports therefor, two rotary main cams located on the axis of the ink drum for oscillating one pair of the ductors between the ink fountain roll and the ink rolls, two additional rotary main cams for oscillating the other pairs of ductors between the ink rolls and the ink drum, two rotary auxiliary cams rotating on the axis of the fountain roll in unison with the main cams for also oscillating the first pairs of ductors, and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll.

8. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, two low speed ink rolls, a high speed ink drum, four ductors, rocking supports therefor, two rotary main cams for oscillating two of the ductors between the ink fountain roll and the ink rolls, two additional rotary main cams for oscillating the other two ductors between the ink rolls and the ink drum, two rotary auxiliary cams for also oscillating the first two ductors, means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll, throw-off cams rotatably mounted on the axis of the auxiliary cams in position to engage the first two ductor supports, and means for turning the throw-off cams to cause them to hold the said ductors out of contact with their ink fountain roll.

9. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls, located between and spaced from the fountain roll and ink drum, two pairs of upper and lower ductors, rocking supports therefor, two alined rotary sleeves on the axis of the ink drum, two rotary main cams fixed on said sleeves for oscillating one pair of the ductors between the ink fountain roll and the ink rolls, additional rotary main cams fixed on said sleeves for oscillating the other pair of ductors between the ink rolls and the ink drum, two alined rotary auxiliary cam sleeves on the axis of the fountain roll, two auxiliary cams fixed on said sleeves and rotating in unison with the main cams for also oscillating the first pair of ductors, and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll.

10. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, two low speed ink rolls, a high speed ink drum, four ductors, rocking supports therefor, two alined rotary sleeves, two rotary main cams thereon for oscillating two of the ductors between the ink fountain roll and the ink rolls, two additional rotary main cams on said sleeves for oscillating the other two ductors between the ink rolls and the ink drum, two alined rotary auxiliary cam sleeves, two auxiliary cams thereon for also oscillating the first two ductors, means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll, throw-off cams rotatably mounted on the auxiliary cam sleeves in position to engage the first two ductor supports, and means for turning the throw-off cams to cause them to hold the said ductors out of contact with the ink fountain roll.

11. In an ink distribution for high speed rotary printing presses, a continuous high speed ink fountain roll, upper and lower ink rolls spaced therefrom, upper and lower ductors, rocking supports therefor, two axially alined rotary main cams operatively connected to their respective rocking supports for oscillating the ductors between the fountain roll and the upper and lower ink rolls, two rotary auxiliary cams on the axis of the ink fountain roll and driven in unison with the said main cams for also oscillating the upper and lower ductors through said upper and lower rocking supports and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the ductors on the ink fountain roll.

12. An inking mechanism according to claim 11 which includes two normally stationary throw-off cams located on the axis of the fountain roll and means operatively connected to said throw-off cams to turn them for causing the cams to engage said rocking supports to hold the ductors out of contact with the ink fountain roll.

13. In an ink distribution for high speed rotary printing presses, a continuous low speed ink fountain roll, a high speed ink drum, upper and lower low speed ink rolls located between and spaced from the fountain roll and ink drum, two pairs of upper and lower ductors, rocking supports therefor, four axially alined main cams located on the axis of the ink drum and operatively connected to their respective rocking supports for oscillating one pair of upper and lower ductors between the fountain roll and the upper and lower ink rolls and the other pair of upper and lower ductors between the ink rolls and ink drum, two auxiliary cams located on the axis of the fountain roll and driven in unison with the main cams for also oscillating the ductors through their rocking supports and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the first pair of upper and lower ductors of the fountain roll.

14. An inking mechanism according to claim 13 which includes two normally stationary throw-off cams located on the axis of the ink fountain roll and means operatively connected to said throw-off cams to turn them to cause the cams to engage their respective rocking supports for holding the first pair of upper and lower ductors out of contact with the fountain roll.

15. In an ink distribution for high speed rotary printing presses, a continuous low speed fountain roll, a high speed ink drum, upper and lower ink rolls located between and spaced from the fountain roll and ink drum, first and second pairs of upper and lower ductors, upper rocking supports for the upper ductors of both pairs, lower rocking supports for the lower ductors of both pairs, four rotary main cams located on the axis of the ink drum and operatively connected to their respective upper and lower rocking supports, for oscillating the first pair of ductors between the fountain roll and ink rolls and the

second pair of ductors between the ink rolls and the ink drum, two rotary auxiliary cams on the axis of the fountain roll and driven in unison with the main cams for also oscillating the ductors through their rocking supports, and means for altering the angular relationship of the auxiliary cams to their main cams to vary the dwell of the first pair of upper and lower ductors on the fountain roll.

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