G. OLSEN.

ROTARY PRINTING OR EMBOSSING MACHINE.

APPLICATION FILED MAY 15, 1914.

1,231,932.

Patented July 3, 1917.

3 SHEETS—SHEET 1.

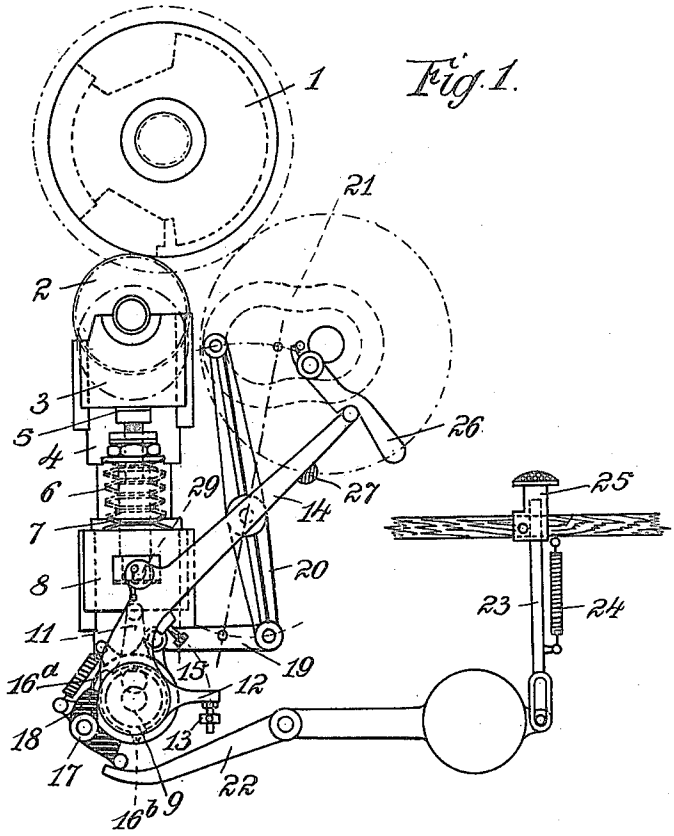


Fig. 1.

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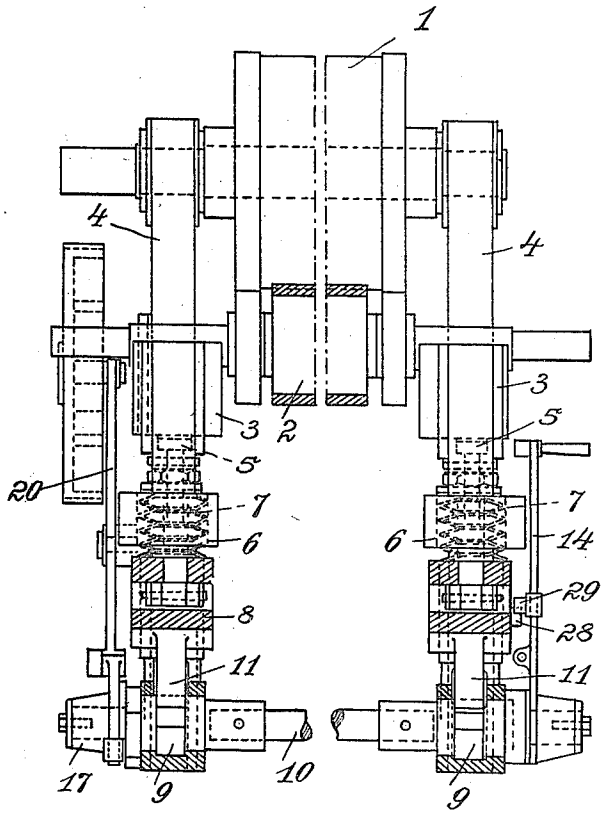
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

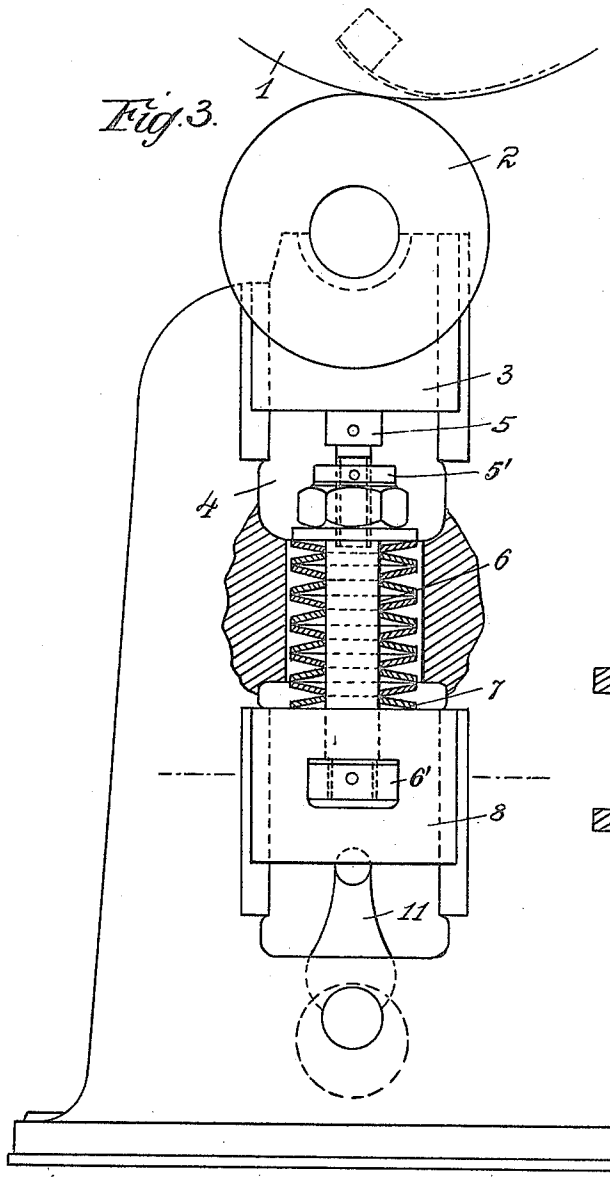
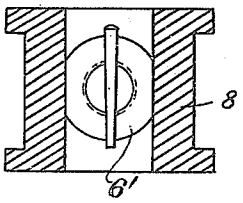


Fig. 4.



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ROTARY PRINTING OR EMBOSSING MACHINE.

1,231,932. Specification of Letters Patent. Patented July 3, 1917.

Application filed May 15, 1914. Serial No. 838,678.

To all whom it may concern:

Be it known that I, GULBRAND OLSEN, chief engineer, and a citizen of the Norwegian Kingdom, and resident of Mittelheim-on-the-Rhine, Germany, have invented new and useful Improvements in or Relating to Rotary Printing or Embossing Machines, of which the following is a specification.

Rotary printing machines comprising a form or printing cylinder with an uninterrupted or interrupted surface and an impression cylinder with an uninterrupted surface or with axially arranged channels for the gripping and tensioning means of the coating, are known. In the known machines the arrangement of the printing members in view of the exchangeable form cylinder is such that the latter is located either side by side or above the stationarily journaled impression cylinder or also below the same, in which latter case the impression cylinder must be screwed upwardly in order to enable the form cylinder to be put in place or removed.

Now the present invention relates to an improved arrangement of the latter kind and offers considerable advantages in connection with the handling of the machine. The invention consists in a combined device of which some parts are *per se* well known but possessing also certain novel features enabling the form cylinder quickly and readily to be moved away from the impression cylinder with the effect of interrupting the printing to a sufficient extent so that it may be removed from the impression cylinder or reinserted without coming into contact with the latter, as will be more clearly understood from a description of the accompanying drawings, in which:

Figure 1 illustrates by way of example a constructional arrangement of the parts according to this invention in a lateral view, and

Fig. 2 an end view thereof.

Fig. 3 shows partly in section an enlarged view of the spring pin arrangement and adjacent parts, and

Fig. 4 is a section on the line *a*—*b* of Fig. 3.

1 is the impression cylinder which is journaled in stationary bearings, 2 is the form cylinder and 3 are the bearings of the form cylinder which are guided on lateral frame parts 4 of the machine and are supported on set screws 5, spring pins 6 and springs 7 of sliding members 8 which are likewise guided in the frame portions 4. 9 are eccentrics journaled in the frame parts and connected by a shaft 10.

As shown more particularly in Figs. 3 and 4, each spring pin 6 carries at its upper end a nut resting on a washer and has its lower end provided with a flattened ring 6′ within a recess in the sliding block 8 so as to be prevented from rotating. The spring 7 is confined between the upper face of the block 8 and the washer which is located below the nut of the pin. By means of this nut the tension of this spring may be adjusted at will. The set screw 5 having a lock nut 5′ enables the printing cylinder 2 to be adjusted with regard to the impression cylinder so that according to the diameter of the former the spring 7 may exercise its full effect.

By means of links 11, the blocks 8 are made to rest on the eccentrics 9 so as to rise or to descend when the eccentrics are rotated and thereby to raise or to lower the bearings 3 and the form cylinder 2. Secured to the eccentric 9 on one side of the machine is an abutment 12, the movement of which is confined by a stop screw 13 arranged on the lateral frame member and by a screw 15 which is arranged on an operating lever 14. Secured, moreover, to the eccentrics are two locking teeth or dogs 16^a and 16^b. Arranged freely to oscillate on a concentric portion of the eccentric is a member 17 carrying a pin with a double locking hook or pawl 18. To this member 17 a connecting rod 19 and a lever 20 actuated by a cam groove 21, which performs one revolution for each impression, impart oscillating movements which are transmitted to the eccentrics by the double pawl 18 in the one or the other sense according to whether the pawl engages with the tooth 16^a or 16^b. This engaging movement is effected through the agency of a lever 22, a rod 23 and a spring 24 from the treadle 25 of the machine. It is thus possible to oscillate the eccentrics from a cam disk so that the abutment 12 may be brought to bear either on the stop screw 13 in which case the form cylinder is raised to its printing position or on the stop screw 15 in which latter case the form cylinder is

moved away from the impression cylinder to the extent of about 5 to 6 mm. That is as long as the treadle 25 is in the position shown in Fig. 1 the spring 24 will maintain the rod 23 in the raised position illustrated and will prevent the lever 22 from rocking on its pivot, it being understood that the tension of the spring 24 is sufficient to overcome the tendency of the weighted end of the lever 22 to drop. In this condition the actuation of the connecting rod 19 and member 17 brought about by the lever 20 and cam 21 will have no effect on the eccentrics 9 but will simply move the pawl 18 toward and away from the dog 16^a and back and forth over the dog 16^b. When it is desired to move the form cylinder 2 away from the impression cylinder about the distance suggested above, the treadle 25 is first depressed against the tension of the spring 24 which causes the lower slotted end of the rod 23 to be similarly actuated and its restraining influence on the lever 22 to be removed. Under the influence of its weighted end this lever 22 now rocks on its pivot and causes its free end to exert a pressure on the pawl 18 which is thereby pivotally moved from engagement with the dog 16^a and operatively engaged with the dog 16^b. The oscillation of the rod 19 and member 17 by the lever 20 and cam 21 will now cause said pawl 18 to exert a pressure on the dog 16^b and thus rotate the eccentrics 9 until the abutment 12 engages the stop 15 whereupon further movement of said eccentrics in this direction is arrested. This actuation of said eccentrics has, however, permitted the blocks 8 and bearings 3 to descend in their respective guides and the form cylinder 2 to move away from the impression cylinder 1 to about the suggested extent. As stated, the stop screw 15 is arranged on the lever 14 which is loosely mounted on one end of the eccentric 9 and is held in its extreme right-hand position by a stop lever 26 and by a fixed abutment 27, so that the screw 15, in this condition of the parts, provides a rigid stop for arresting the movement of the abutment 12 as described. A projection 28 on the sliding member 8 in coöperating with a pin 29 projecting from the lever 14, as soon as the member 8 arrives at its highest position prevents the lever 14 from being moved to the left. When the sliding member and consequently the form cylinder have been lowered by the cam groove 21 to the extent of about 5 to 6 mm., the projection 28 and the pin 29 have been moved out of coöperative engagement with each other so that the lever 14 may be turned to the left to the extent of about 130° after the stop lever 26 has been raised for the purpose of permitting an abnormal separation of the cylinders 1 and 2. That is after the abutment 12 has been brought to bear on the stop screw 15 on the lever 14 in the manner described and the lever 14 is moved to the left as suggested, the said abutment 12 under the weight of the cylinder 2 and its bearings and connected parts on the eccentrics 9 will follow the screw 15 thus causing the form cylinder together with its bearings to descend a distance slightly more than half the diameter of its pivot or trunnion and to move away from the impression cylinder to such an extent as to enable it to be raised from its bearings or inserted therein without contact with the impression cylinder. When it is desired to return the cylinder 2 from its first mentioned lowered position to its initial position in engagement with the cylinder 1, the treadle 25 is returned to the position shown in Fig. 1 which causes the lever 22 to be rocked back on its pivot and its free end to be moved away from the pawl 18. The latter under the influence of its spring is now again brought into operative engagement with the dog 16^a so that the oscillation of the member 17 will cause said pawl 18 to exert a pressure on said dog 16^a and thus return the eccentrics 9 to the normal position and the cylinder 2 into engagement with the cylinder 1. To return the cylinder 2 from its abnormally lowered position to its initial position the operation is the same excepting that the lever 14 is first moved back toward the right and locked in the position shown in Fig. 1. This return movement of said lever 14 will, through the coöperation of the screw 15 and abutment 12 impart an initial rotation to the eccentrics 9 in the return direction or to the point where the further return of the cylinder 2 is accomplished by the pawl 18, dog 16^a, member 17 and their connections with the cam 21. The cylinder 2 is prevented from unintentionally dropping from its normal position owing to the fact that the eccentrics 9 have their common concentric axis in vertical alinement with the vertical centers of the blocks 8 and bearings 3 and the axis of the roller 2 so that in the raised position the eccentric axes of said eccentrics are similarly located and the parts are at what may be termed dead center.

Now what I claim and desire to be secured by Letters Patent is the following:

1. In rotary printing machines, an impression cylinder, a coöperating form cylinder, mechanism for moving said form cylinder away from said impression cylinder, a stop whereby said movement of the form cylinder is arrested at a predetermined point and means for shifting said stop whereby said form cylinder is moved beyond said predetermined point.

2. In rotary printing machines, an impression cylinder, a coöperating form cylinder, mechanism for moving said form cylin-

der away from said impression cylinder, a stop whereby said movement of the form cylinder is arrested at a predetermined point, means for shifting said stop whereby said form cylinder is moved beyond said predetermined point and means for locking said stop shifting means in its initial position.

3. In rotary printing machines, an impression cylinder, a coöperating form cylinder, mechanism for moving said form cylinder away from said impression cylinder, a stop whereby said movement of the form cylinder is arrested at a predetermined point, means for shifting said stop whereby said form cylinder is moved beyond said predetermined point and coöperating means connected respectively with said form cylinder and said stop shifting means whereby the latter is locked against operation when said form cylinder is in its normal position.

4. In rotary printing machines, an impression cylinder, a coöperating form cylinder, movable supports for said form cylinder whereby the latter is movable toward and away from said impression cylinder, eccentrics connected with said supports whereby the latter are actuated to move said form roller and means for arresting the movement of said eccentrics when said form cylinder has moved a predetermined distance away from said impression cylinder, said means being movable to permit an abnormal predetermined movement of said form cylinder away from said impression cylinder.

5. In rotary printing machines, an impression cylinder, a coöperating form cylinder, mechanism for moving said form cylinder a predetermined normal distance away from said impression cylinder, said mechanism being normally disconnected from said form cylinder, means for operatively connecting said mechanism with said form cylinder and means whereby said mechanism is actuated to move said form cylinder a predetermined abnormal distance away from said impression cylinder.

6. In rotary printing machines, an impression cylinder, a coöperating form cylinder, eccentrics connected with said form cylinder whereby the latter is moved away from said impression cylinder, an operating cam, mechanism actuated by said cam, means whereby said mechanism is connected with or disconnected from said eccentrics, a stop whereby the movement of said eccentrics in one direction is limited to arrest the movement of said form cylinder away from said impression cylinder at a predetermined point and means for shifting said stop whereby said eccentrics are actuated to move said form cylinder beyond said predetermined point away from said impression cylinder.

7. In rotary printing machines, an impression cylinder, a coöperating form cylinder, eccentrics connected with said form cylinder whereby the latter is moved away from said impression cylinder, a member rotatably mounted on the axis of said eccentrics, an operating cam, a connection between said member and said cam, means whereby said member is connected with or disconnected from said eccentrics, a lever pivotally mounted on the axis of said eccentrics, coöperating stops on said lever and said eccentrics whereby the movement of the latter in one direction is limited to arrest the movement of said form cylinder away from said impression cylinder at a predetermined point, said lever being movable to shift the stop carried thereby whereby said eccentrics are actuated to move said form cylinder beyond said predetermined point away from said impression cylinder and releasable means for locking said lever in its initial position.

8. In rotary printing machines, an impression cylinder, a coöperating form cylinder, eccentrics connected with said form cylinder whereby the latter is moved away from said impression cylinder, a member rotatably mounted on the axis of said eccentrics, an operating cam, a connection between said member and said cam, means whereby said member is connected with or disconnected from said eccentrics, a lever pivotally mounted on the axis of said eccentrics, coöperating stops on said lever and said eccentrics whereby the movement of the latter in one direction is limited to arrest the movement of said form cylinder away from said impression cylinder at a predetermined point, said lever being movable to shift the stop carried thereby whereby said eccentrics are actuated to move said form cylinder beyond said predetermined point away from said impression cylinder and coöperating means connected with said form cylinder and said lever whereby a movement of the latter is prevented when the form cylinder is in its normal position.

9. In rotary printing machines, an impression cylinder, a coöperating form cylinder located beneath the same, vertically movable supports for said form cylinder, an eccentric, a connection from said eccentric to said supports, spaced dogs on said eccentric, a member rotatably mounted on the axis of said eccentric, an operating cam, a connection between said cam and said member, a pawl carried by the latter, means for moving said pawl into operative engagement with one or the other of said dogs whereby said member is operatively connected with said eccentric and the latter is operated in one direction or an opposite direction by said cam to move said form cylinder toward or away from said impression cylinder, a lever pivotally mounted on the axis of said eccentric, coöperating stops on said lever and eccentric whereby the movement of the lat-

ter in one direction is limited to arrest the movement of said form cylinder away from said impression cylinder at a predetermined point, said lever being movable to shift the stop carried thereby whereby said eccentric is actuated to move said form cylinder beyond said predetermined point away from said impression cylinder, coöperating means on one of said form cylinder supports and said lever whereby a movement of the latter is prevented when the form cylinder is in its normal position and releasable means for locking said lever against operation independently of said coöperating means.

10. In rotary printing machines an impression cylinder, a coöperating form cylinder removably journaled in said machine, mechanism for automatically moving said form cylinder out of contact with said impression cylinder during each rotation of the latter and manually operated means for moving said form cylinder away from said impression cylinder a distance exceeding half the diameter of the journals of said form cylinder.

11. In rotary printing machines an impression cylinder, a coöperating form cylinder removably journaled in said machine, mechanism for adjusting the position of the form cylinder to contact with the impression cylinder, mechanism for automatically moving the form cylinder out of contact with the impression cylinder during each revolution of the latter, and means for moving the form cylinder away from the impression cylinder a distance exceeding half the diameter of the journals of said form cylinder.

That I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this day of April 30th, 1914.

GULBRAND OLSEN.

Witnesses:

WILHELM ALLENDORF,

OSKAR FINKHAUS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."