

Jan. 6, 1953

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2,624,274

MACHINE FOR PRINTING CYLINDRICAL ARTICLES

Filed April 25, 1951

2 SHEETS—SHEET 1

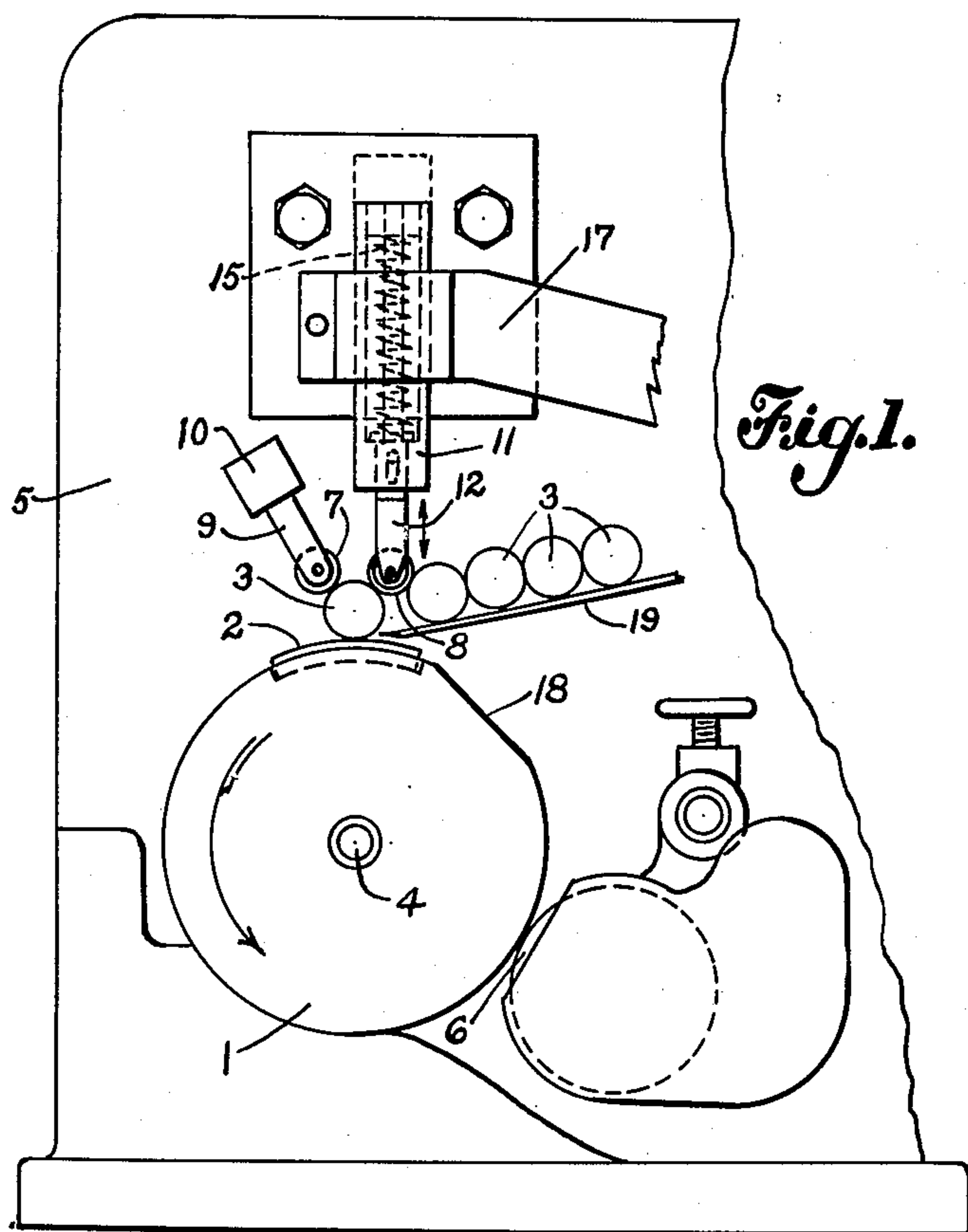


Fig. 1.

Fig. 4.

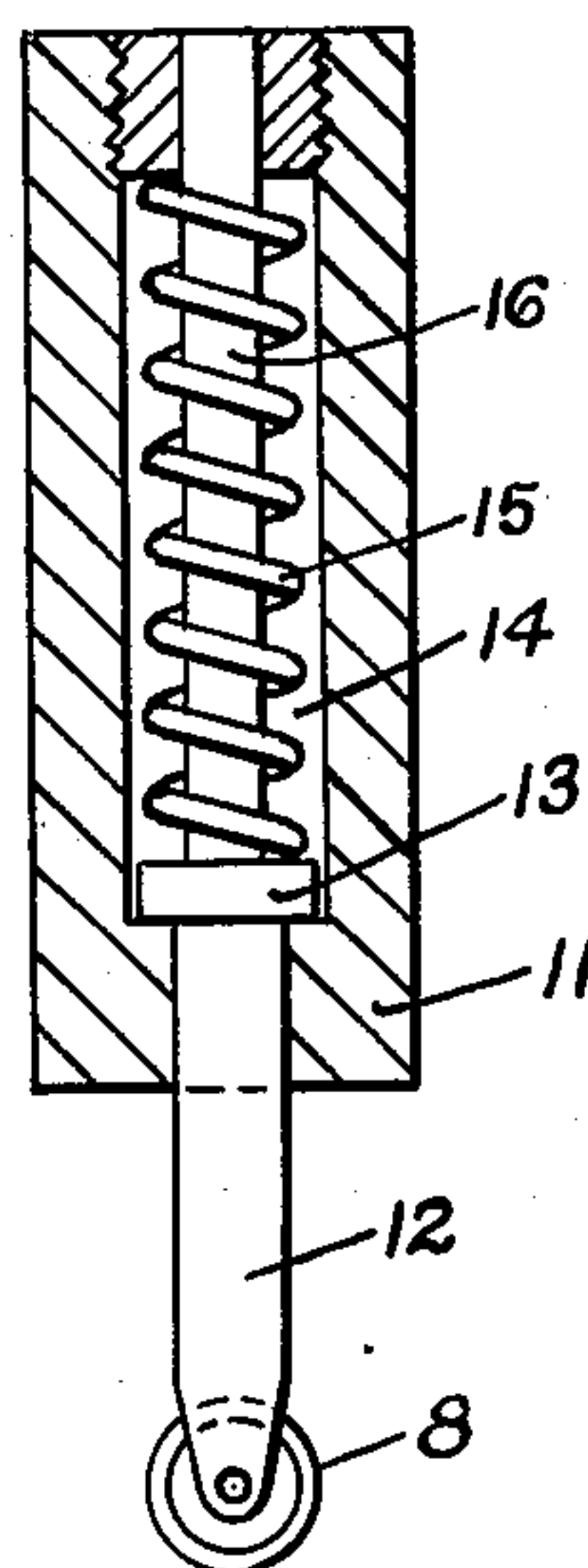


Fig. 2.

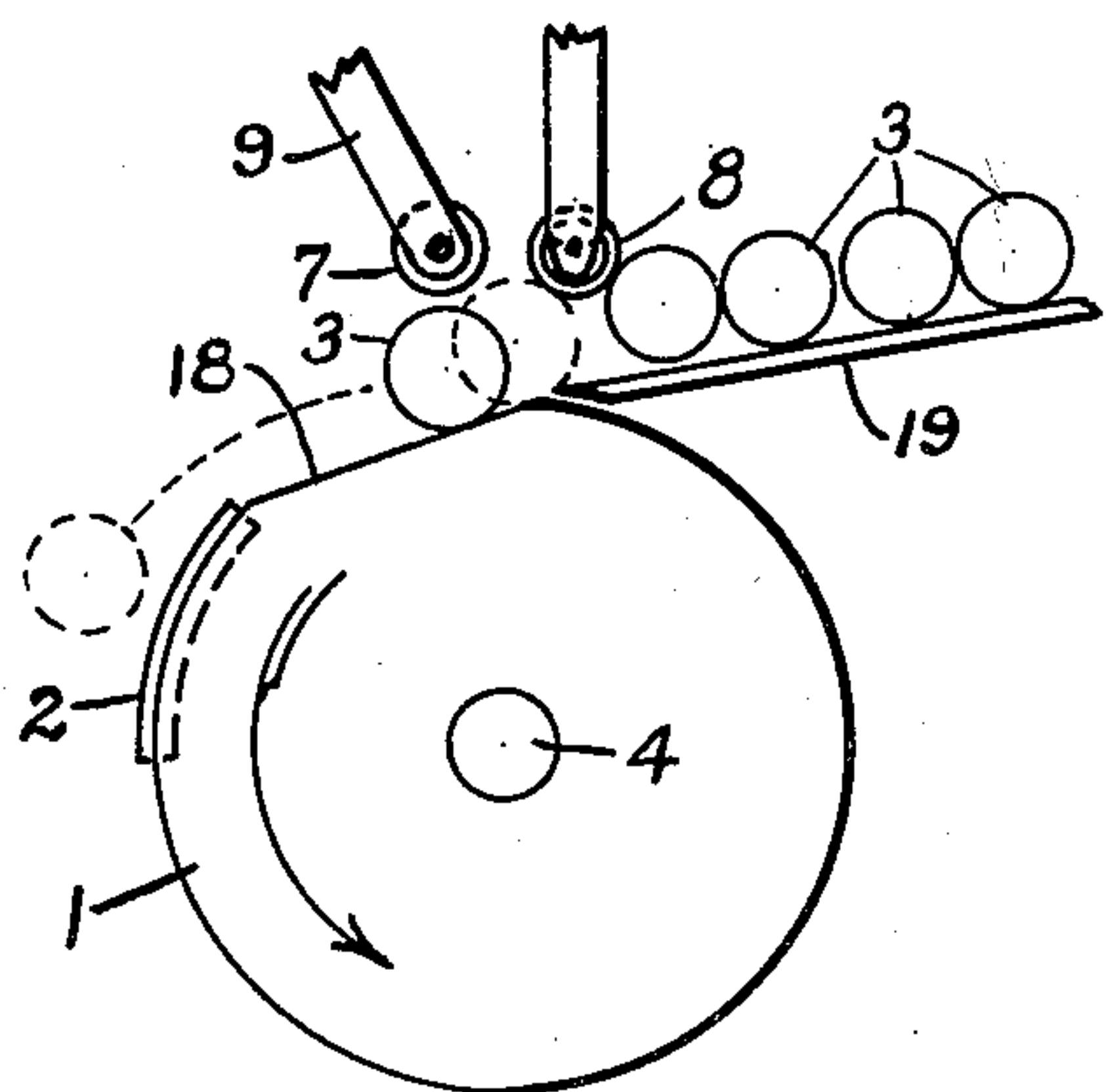
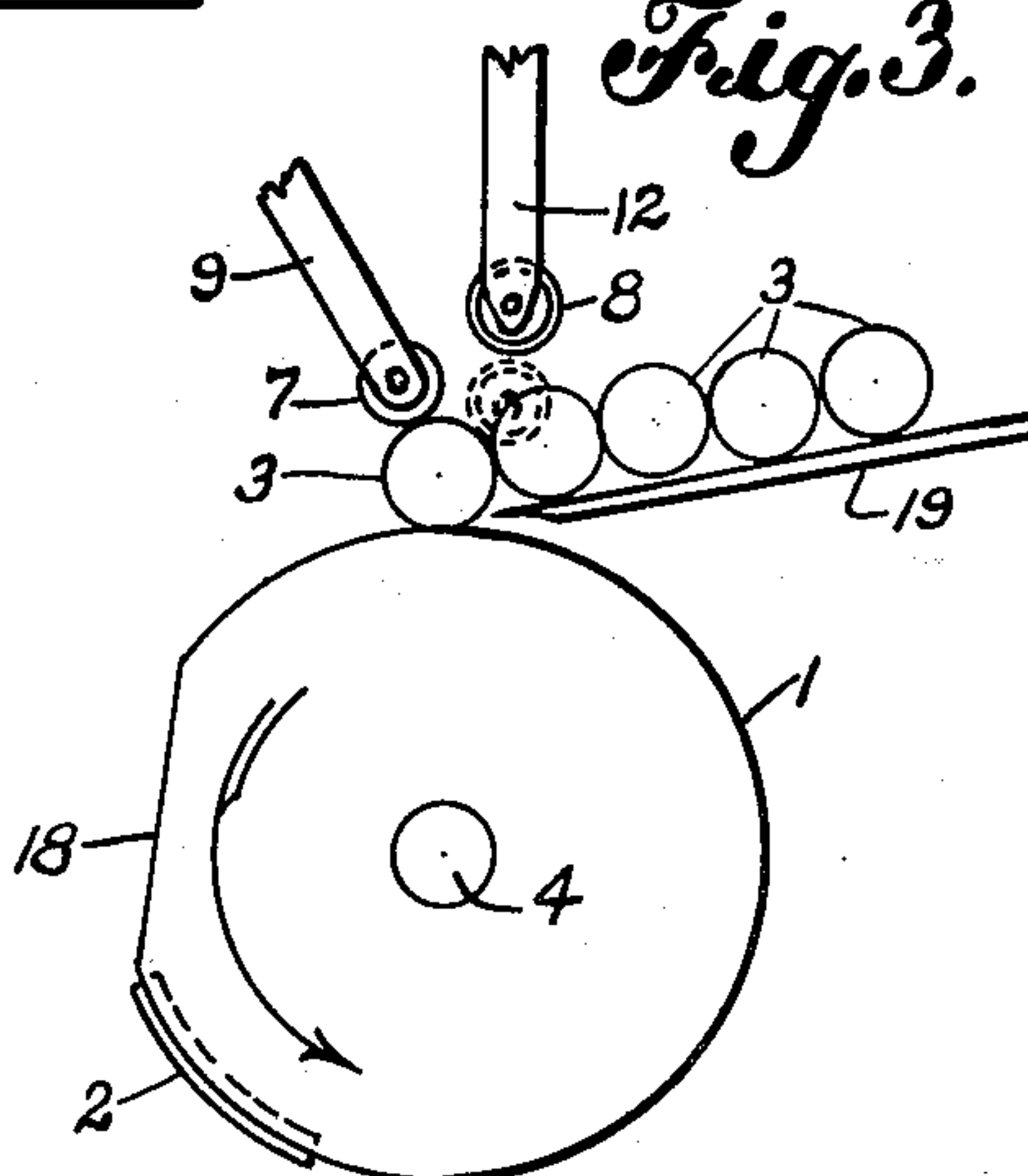


Fig. 3.



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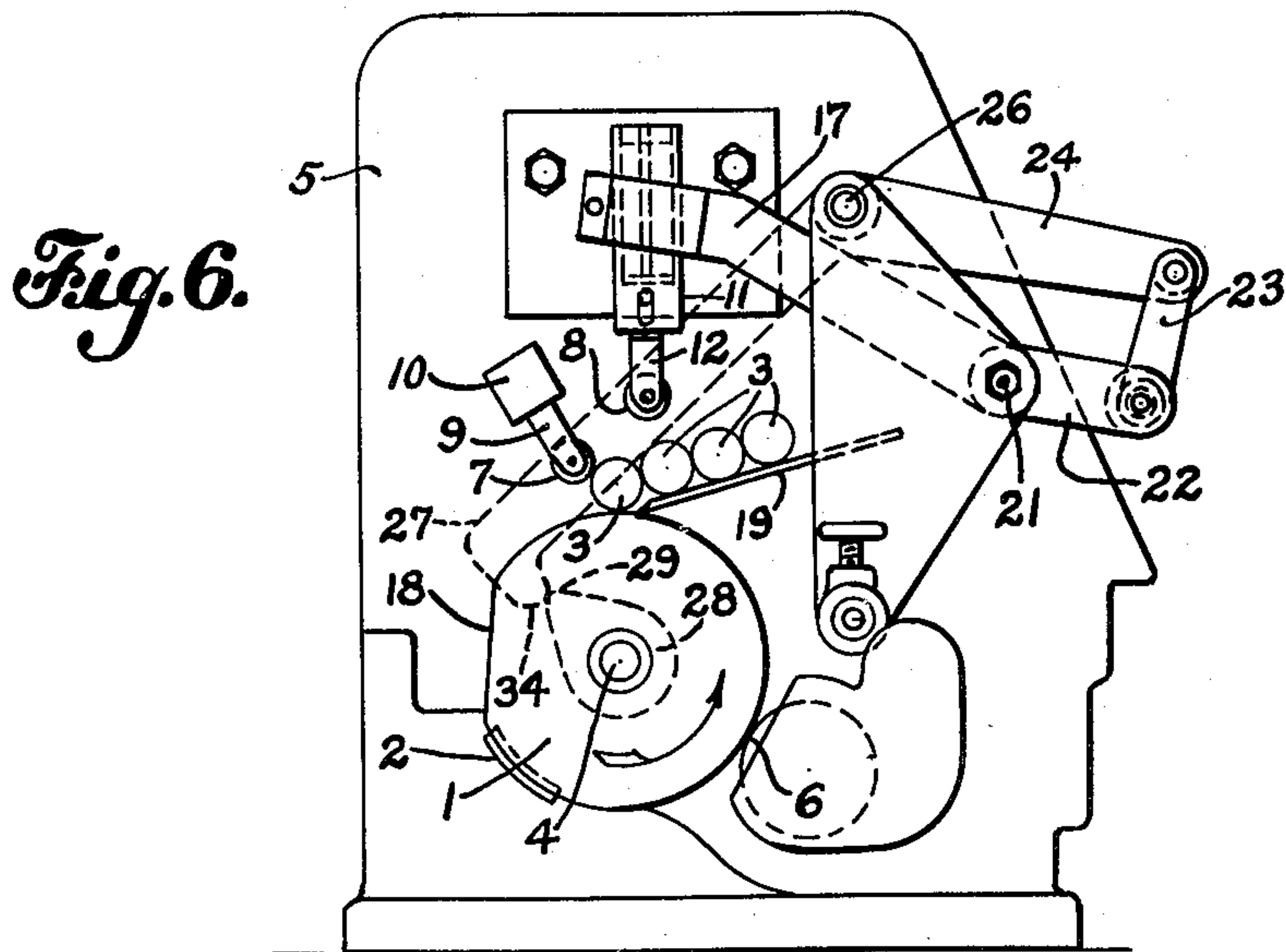
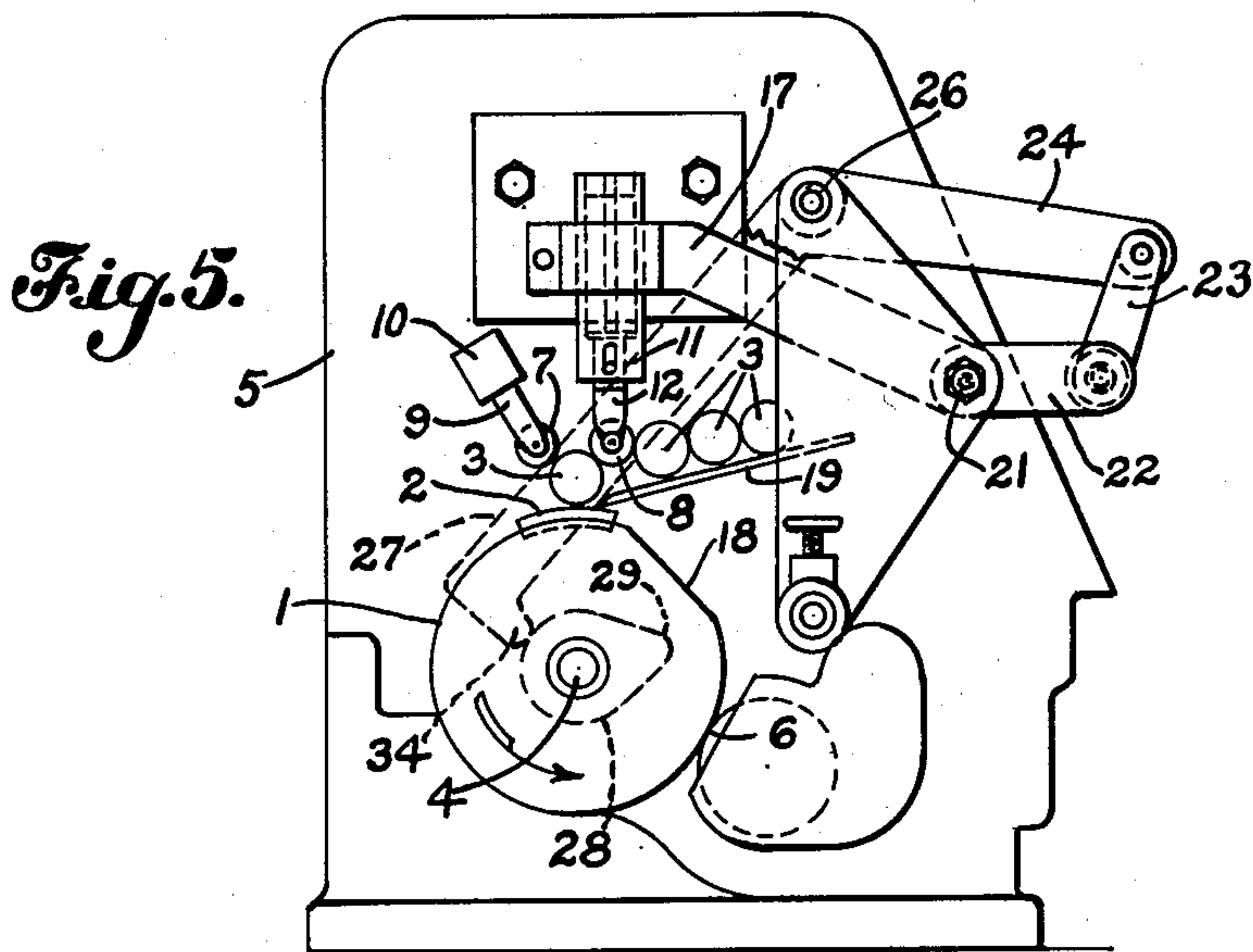
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2 SHEETS—SHEET 2



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MACHINE FOR PRINTING CYLINDRICAL ARTICLES

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Application April 25, 1951, Serial No. 222,915

1 Claim. (Cl. 101—40)

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This invention relates to a machine for making an imprint on a cylindrical article and is in the nature of an improvement on the machines shown in U. S. Patents No. 2,459,538 dated January 18, 1949, and No. 2,461,233 dated February 8, 1949.

The machines shown in said patents comprise a printing cylinder having on its periphery a printing member carrying the type characters by which the printed impression is made on the cylindrical article, an article holder or mask situated above the cylinder and having a vertical opening extending therethrough of a size to freely receive the cylindrical article to be printed, and a hold-down element to yieldingly press the cylindrical article against the printing cylinder during the printing operation, the arrangement being such that when the cylindrical article is deposited in the opening of the mask said article will rest on the printing cylinder with its axis parallel to that of the cylinder, and at the same time will be free from rotation within the opening of the article holder so that when the printing cylinder is rotated the article within the holder or mask will be rotated about its axis by its frictional engagement with the periphery of the printing cylinder, and during such rotation the type characters of the printing member will make the desired printed impression on the article.

The object of the present invention is to provide an improved form of article holder and improved means for discharging each printed article from the printing cylinder, and for delivering to the printing cylinder into printing position an unprinted article.

In the drawings wherein there is illustrated a selected embodiment of the invention:

Fig. 1 is a view showing a cylindrical article in position to receive its printed impression from the printing cylinder.

Fig. 2 is a view illustrating the manner in which the printed article is discharged from the printing cylinder.

Fig. 3 is a view illustrating the manner in which an unprinted cylindrical article is delivered into printing position.

Fig. 4 is a fragmentary sectional view showing the mounting for the positioning member 8.

Fig. 5 is a view similar to Fig. 1 but showing the means for moving the hold-down member into and out of operative position.

Fig. 6 is a view similar to Fig. 5 showing the hold-down member in its raised position.

In the drawings, 1 indicates a printing cyl-

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inder having on its periphery a printing member 2 carrying the type by which the desired imprint is made on a cylindrical article 3, said cylinder 1 being mounted on a driven shaft 4 which is journaled in a suitable frame 5. 6 indicates an inking roll by which the printing member 2 is inked during each rotation of the printing cylinder.

The cylindrical article 3 is held in printing position by an article-holding device embodying the present invention and which will presently be described, the construction being such that when during the rotation of the printing cylinder 1 the printing member 2 is brought into contact with the article 3 the latter will be rotated by its frictional contact with the printing member, and thereby the desired printed impression will be made on said article.

In accordance with this invention the article 3 is held in printing position against the printing cylinder by two rotary article-positioning members 7 and 8 which are normally spaced apart a distance less than the diameter of the cylindrical article 3 so that between them they hold said article in its printing position, as shown in Fig. 1.

Both article-positioning members 7 and 8 are freely rotatable, and the member 7 is carried by an arm 9 which is rigidly secured to a suitable bracket 10 carried by the frame 5. Said member 7 is thus held in stationary position although it is freely rotatable about its axis.

The other member 8 is in the nature of a combined positioning member and hold-down member. It is carried by a vertically movable head 11 by which it is moved from its lower operative position shown in Fig. 1 to its raised inoperative position shown in Fig. 3.

Said member 8 is mounted on the lower end of a stem 12 which extends into the head 11 and has thereon a collar 13 which is received in a recess 14 with which the head 11 is provided. The stem 12 is acted upon by a spring 15 which encircles the portion 16 of the stem above the collar, said spring yieldingly holding the stem with the collar resting against the bottom of the recess 14.

The head 11 is shown as carried by a vertically moving arm 17 which by its vertical movement raises the combined article-positioning and hold-down member from its lowered operative position to its raised inoperative position and then returns it again to its operative position.

When the roll 8 is in its lowered operative po-

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sition it is yieldingly pressed against the article 3 by means of the spring 15, and it thereby functions as a yielding hold-down member as well as an article-positioning member which cooperates with the member 7 to hold the article 3 in printing position. One purpose of the spring 15 is to provide means for yieldingly pressing the article 3 against the printing member 2 during the printing operation, thereby to produce a proper imprint notwithstanding any irregularities that may exist in the contour of the article 3.

The periphery of the printing cylinder is concentric throughout its major portion, but it is formed with the flat section 18 that is situated immediately in the rear of the printing member 2. The purpose of this flat section is to provide for the discharge of the printed article 3 after the printing operation has been completed.

So long as article 3 is resting on the concentric portion of the periphery of the cylinder 1 the article 3 will be held in its printing position, as shown in Fig. 1, but when the imprint has been made on the article and the flat section 18 is moved into the position shown in Fig. 2 by the rotation of the cylinder 1 there is provided ample space between the member 7 and the flat section of the cylinder 1 for the article 3 to roll out of printing position, as shown in Fig. 2, and thus be discharged from the cylinder.

The articles 3 to be printed are delivered into printing position from a chute 19 and when the arm 17 is in its lowered position and the roll 8 is in its operative position shown in Fig. 1, it not only serves to assist in holding the article 3 in printing position but it also serves to prevent the unprinted articles in the chute 19 from rolling down into printing position.

The means for moving the arm 17 up and down may be substantially the same as illustrated in Patents Nos. 2,459,538 and 2,461,233. As shown in Figs. 5 and 6, the arm 17 is pivoted to the frame of the machine at 21, and the end 22 of said arm is connected by a link 23 with the arm 24 of an elbow lever that is pivoted to the frame at 26. The other arm 27 of said elbow lever has a projection 34 which cooperates with a cam 28 fast on the shaft 4.

On each rotation of the shaft 4 the high point 29 of the cam 28 will act on the arm 27 of the elbow lever and turn said lever in a clockwise direction, thereby depressing the outer end 22 of the arm 17 and raising the other end which carries the hold-down roll 8.

When the end 34 of the lever arm 27 is resting on the low part of the cam 28, the hold-down roll 8 will be in its lowered operative position shown in Figs. 1 and 5. The cam 28 is so formed that the high point 29 of the cam will engage the end 34 of the lever arm 27 just after the flat section 18 of the printing cylinder has been carried past the stationarily-mounted article-positioning member 7 and after the cylindrical portion of the printing cylinder 1 has been brought underneath said article-positioning member, as shown in Figs. 3 and 6.

Such turning movement of the elbow lever 27, 25 raises the outer end of the arm 17 and moves the hold-down member 8 into its elevated inoperative position, and as soon as this occurs the end article 3 in the chute will roll down onto the printing cylinder and against the article-positioning member 7, as shown in Fig. 3. Since the periphery of the article-positioning member 7 is spaced from the cylindrical

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surface of the printing cylinder 1 by a distance less than the diameter of the article 3, said article which has thus been delivered from the chute 19 will be brought to rest in the printing position, as shown in Fig. 3.

After the high point 29 of the cam 28 passes out from under the end 34 of the arm 27, said arm and hold-down member 8 will be restored to their normal operative position, and during this movement the member 8 will be crowded between the article 3, which is in printing position, and the adjacent article at the end of the chute, thereby forcing the article on the chute backwardly slightly. In its lowest position the hold-down member 8 engages the article 3 which is in printing position, as shown in Figs. 1 and 5, and cooperates with the article-positioning member 7 to hold the article in printing position while the imprint is made thereon.

I claim:

A machine for printing cylindrical articles comprising a printing cylinder, a printing member carried thereon, means to rotate said printing cylinder, a chute for delivering unprinted cylindrical articles to the printing cylinder, article-positioning means for holding a cylindrical article to be printed in printing position resting on the printing cylinder and with its axis parallel to that of the printing cylinder, said means including a stationarily-mounted freely-rotatable article-positioning member situated above the printing cylinder with its periphery spaced from that of the printing cylinder by a distance less than the diameter of the cylindrical article being printed, and also including a cooperating freely rotatable combined article-positioning and hold-down member movable vertically between a lowered operative position in which it is spaced from the stationarily-mounted article-positioning member by a distance less than the diameter of said cylindrical article, and is positioned to engage the bottom cylindrical article in the chute and restrain it from forward movement, and a raised inoperative position in which the bottom cylindrical article in the chute is released, said printing cylinder having a flat surface at the trailing end of the printing member whereby when said flat peripheral surface moves into position beneath the stationarily-mounted article-positioning member a sufficient space is provided between said member and the printing cylinder for the discharge of the printed cylindrical article, and means to raise the combined article-positioning and hold-down member when the flat surface of the printing cylinder moves out of a position underneath the stationarily-mounted article-positioning member and the cylindrical peripheral portion of the printing cylinder moves into such position, thereby releasing the bottom cylindrical article in the chute and allowing it to roll into printing position against the stationarily-mounted article-positioning member.

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