G. W. SWIFT, Jr.

FEEDING DEVICE.

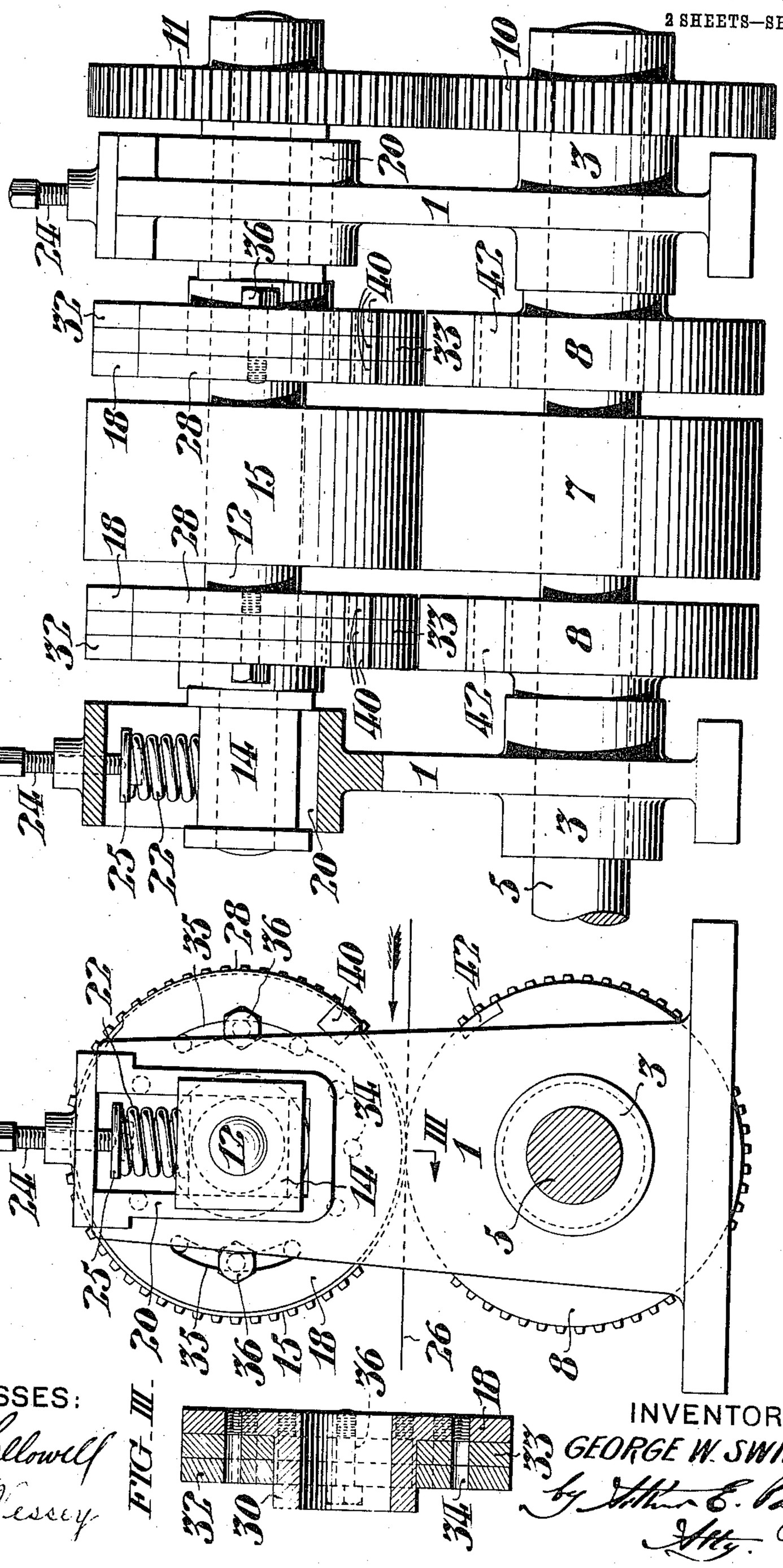
APPLICATION FILED AUG. 17, 1908. RENEWED NOV. 20, 1909.

963,828.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

FIG. II.



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2 SHEETS—SHEET 2.

FIG. IV.

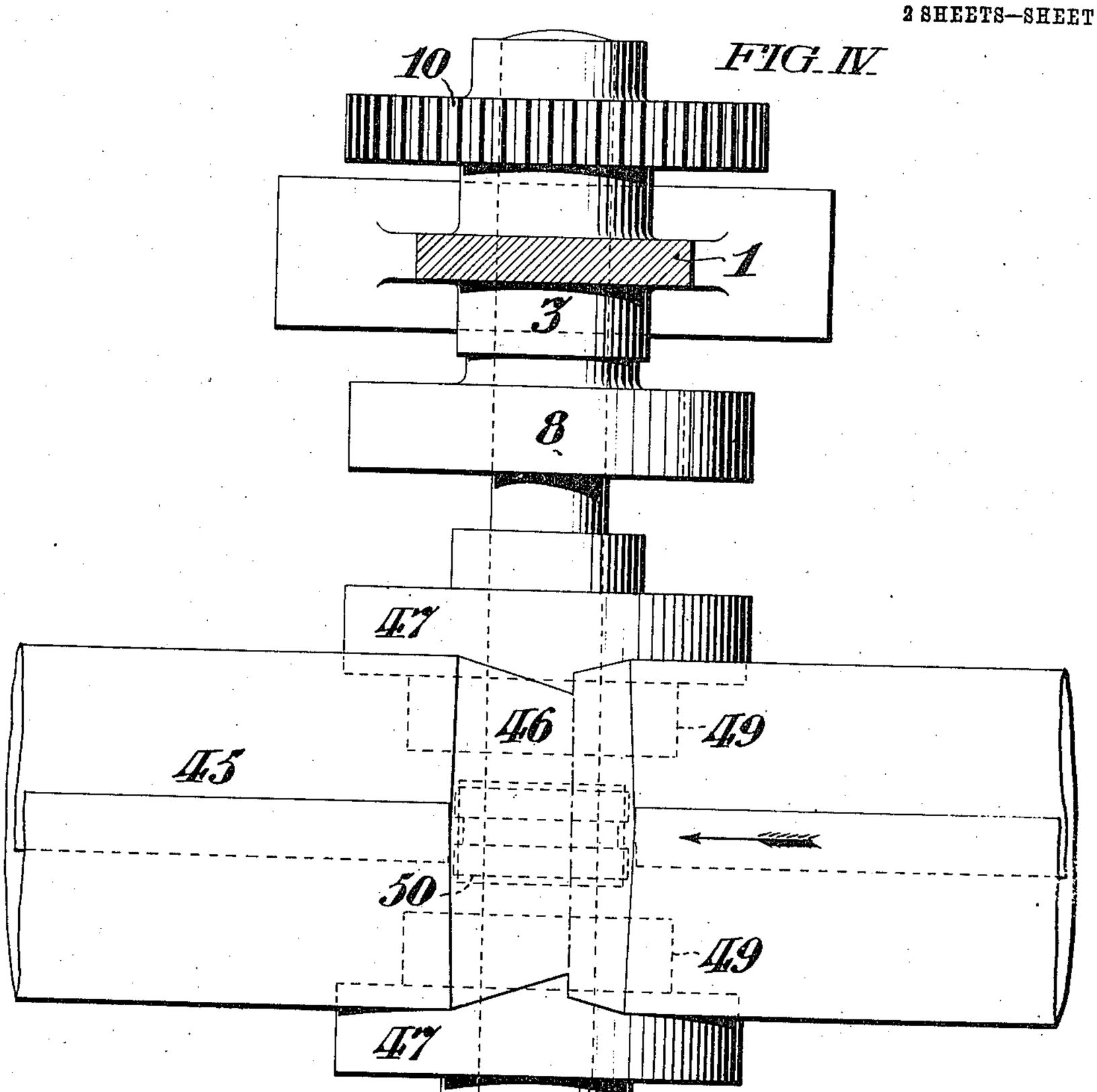


FIG. V.

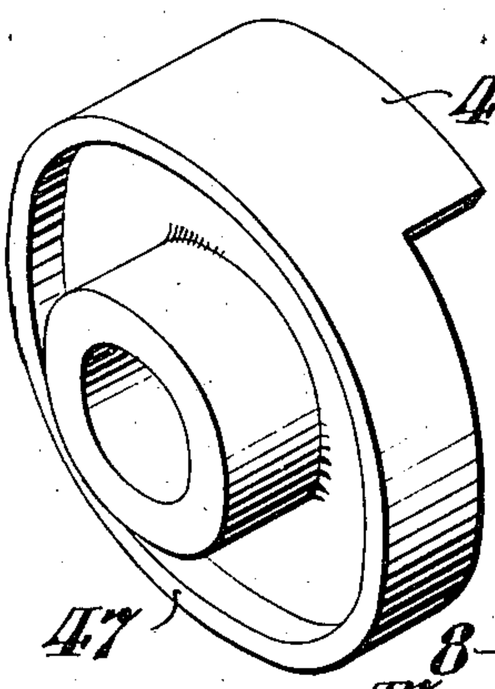


FIG. VI.

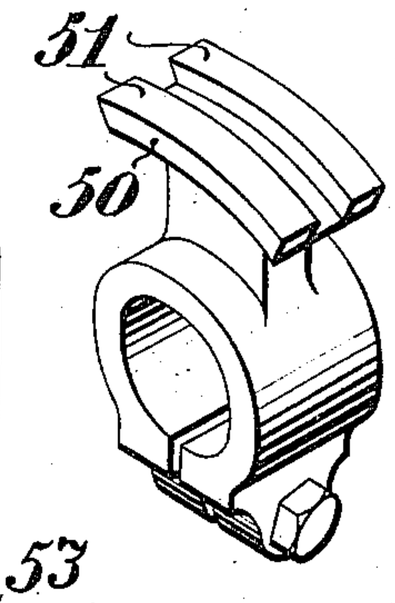
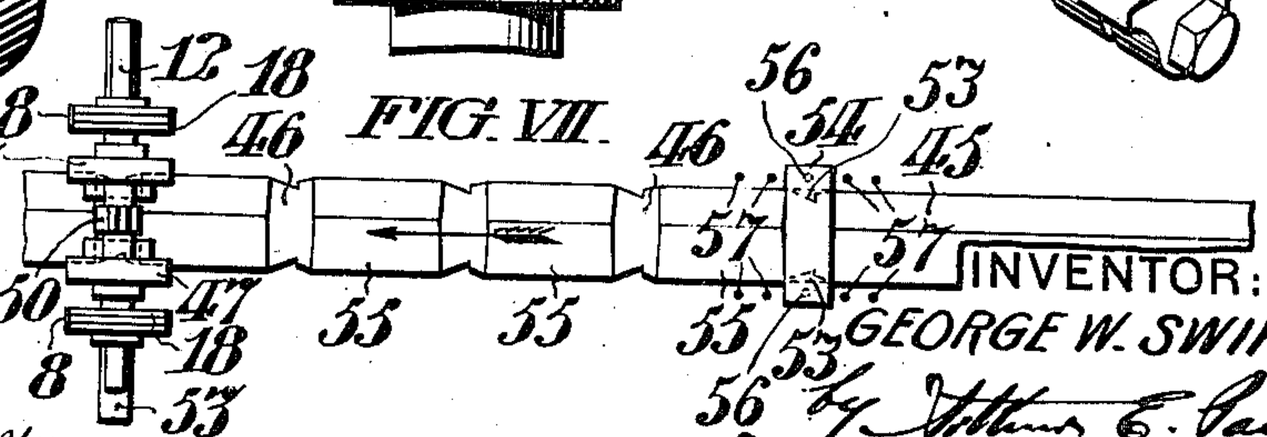


FIG. VII.



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UNITED STATES PATENT OFFICE.

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FEEDING DEVICE.

963,828. Specification of Letters Patent. Patented July 12, 1910.

Application filed August 17, 1908, Serial No. 448,959. Renewed November 20, 1909. Serial No. 529,095.

To all whom it may concern:

Be it known that I, GEORGE W. SWIFT, Jr., of Bordentown, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Feeding Devices, whereof the following is a specification, reference being had to the accompanying drawings.

My improvement relates to mechanism arranged to effect the intermittent progressive movement of a web of paper or other flexible fabric which it is desired to intermittently print, perforate, notch, or otherwise modify at successive equal intervals of its length; said intervals being determined by the extent of each progressive movement of the web, with respect to the modifying means.

As hereinafter described, my invention may be advantageously employed to feed a web which is of different thicknesses in different regions; for instance, a substantially plane web formed by a collapsed paper tube, from which series of bags or envelops may be formed; said web having three thicknesses of the fabric where the latter is overlapped at its medial longitudinal region; two thicknesses of fabric elsewhere throughout the tube; and a single thickness of the fabric where one of the opposed plane walls of the tube is cut away to form closure flaps of the remaining single thickness.

The form of my invention hereinafter described, comprises two parallel shafts capable of continuous rotation and relative movement toward and away from each other, and carrying cylindrical feed rolls opposed to each other to grip the web between them; one of said shafts being provided with cams having high portions of variable circumferential extent at the opposite ends of its cylindrical feed roll, arranged to encounter the opposed cylinder carried by the other shaft, and separate said feed rolls so they do not grip the web during the passage of said high portions; whereby, the length of the web gripped and progressed by said feed rolls at each revolution is variably determined by the circumferential extent of the high portions of said cams.

My improved feeding mechanism may be employed in coöperative relation with a press adapted to modify a web, as above contemplated, at uniform intervals of time, and, the variations in the lengths of the web progressed between successive operations thereon by said press, determined solely by the chronological correlation of the movement of said feed rolls and press, regardless of the distance between said two devices. However, in order that the gripping of the feed rolls upon the web may be effected in definite relation to the print, notch or other modification of the web, effected by the press the relative location of the two mechanisms must be varied in correspondence with the predetermined length of the feeding movements of said rolls, so that the distance between said two devices bears aliquot relation to the extent of said individually successive feeding movements. In other words, in the latter case, the feeding and pressing devices must be susceptible of variable correlation, both as to their time of operation and as to their relative location.

My invention comprises the various novel features of construction and arrangement hereinafter more definitely specified.

In the accompanying drawings; Figure I is a side elevation of mechanism conveniently embodying my invention. Fig. II is an elevation of said mechanism, as seen from the right side of Fig. I. Fig. III is a central vertical sectional view of one of the adjustable cams, taken on the line III, III, in Fig. I. Fig. IV is a plan sectional view, taken on a plane with the web, showing a modified form of my invention. Fig. V is a perspective view of one of the feeding rollers shown in Fig. IV. Fig. VI, is a perspective view of the roller sector, shown in Fig. IV. Fig. VII, is a diagrammatic plan view, showing the relation of the pressing and feeding mechanisms with respect to the web.

In said figures; the side standards 1, have bearings 3, for the main driving shaft 5, which carries the cylindrical roller 7, and cylindrical disks 8, and is provided with the gear 10, engaged with the gear 11, on the countershaft 12. Said shaft 12, is journaled in the bearing boxes 14, and carries the cylindrical roller 15, in opposition to said cylindrical roller 7, and, the cams 18, having high portions opposed to said cylindrical disks 8.

The bearing boxes 14, are mounted for vertical reciprocation in the housings 20, and are normally depressed by the springs 22, whose tension may be varied by adjust-

ment of the set screws 24, bearing upon the spring caps 25. Said springs 22, normally press the roller 15, to grip the web 26, against the roller 7, so that, said rollers being continually rotated, said web is progressed by them until the high surfaces 28, of the cams 18, encounter their respective opposed disks 8, and lift said shaft 12, thus raising said roller 15 from the web 26, which then remains stationary while the rollers 7 and 15, continue to rotate in separated relation, during the passage of said cam surfaces 28. When said surfaces turn out of contact with said disks 8, said roller 15 is again lowered and the feeding movement of said web 26 resumed.

As shown in Fig. III, each of the cams 18, comprises a hub 30, upon which is mounted the counterpart leaves 32 and 33, which have the same peripheral contour as said cams, but are rotatively adjustable on said hub, to vary the effective circumferential extent of said surfaces 28. Said leaves have slots 35, through which the adjusting screws 36, extend in threaded engagement with said cams, so that said leaves and cams may be set in adjusted position. As shown in Fig. I; said slots 35 permit a limited adjustment of the leaves 32 and 33, and the cams 18 are provided with a circular series of threaded apertures 34, with which the adjusting screws 36, may be selectively engaged, to permit further adjustment. As shown in Figs. I and II, said cams 18, and leaves 32 and 33, which are conveniently formed of cast iron, are provided with the steel blocks 40, forming the forward edges of their high surfaces 28, and arranged to respectively encounter the steel plates 42, in the opposed edges of the disks 8, so as to resist the wear which would deform said cam and disk edges if made of cast iron.

Referring to Fig. II, it is to be understood that the cylindrical rollers 7 and 15, may be made of any desired length suitable for the width of the web which is to be progressed by them, and although they may be conveniently continuous throughout their length, as shown in said figure, if the web is of uniform thickness; I find it convenient to divide said rollers and arrange them to engage only the opposite edges of the web if the latter is printed either with ink or adhesive, because such materials adhere to the roller when under pressure.

The form of my invention shown in Fig. IV, may be advantageously employed to feed a web which is of different thicknesses in different regions. For instance, the substantially plane web 45, is formed by a collapsed paper tube, from which series of bags or envelops may be formed, said web having three thicknesses of the paper where the latter is overlapped at its medial longitudinal region; two thicknesses of paper elsewhere throughout the tube; and a single thickness of the paper where the upper wall of the tube is cut away at the recessed regions 46, which are formed at predetermined intervals corresponding with the desired length of the bags or envelops for which the circumferentially adjustable cams above described, are set. It may be noted that the single thickness of paper forming the lower wall of the tube at said recessed regions 46, is arranged to form the closure flaps for respective bags when severed on the dash and dot line shown in Fig. IV. In this form of my invention, the feeding rollers 47 are divided and separated as above contemplated, so as to grip said web 45 only at its edges, and, said rollers are conveniently provided with lateral sectoral flanges 49, which register with said recessed regions 46, of the web, and thus support the latter where notched at the edges. Moreover, the roller sector 50, whose curved face 51, is co-extensive with the longitudinal extent of the single thickness of the web, and whose radius is slightly greater than the radius of the rollers 47, is disposed upon the shaft 53, between the rollers 47, to grip the web at its successive regions of minimum thickness.

Referring to Fig. VII; it is to be understood that the sector 50, and rollers 47 shown in Fig. IV, are opposed to similar members carried by a shaft 12, as in Figs. I and II, and that the disks 8 are engaged by the effective faces 28, of the cams 18, such as shown in said figures.

The modification of the web at successive equal intervals of its length, as above contemplated, and typified by the recessed regions 46 of the web 45, shown in Fig. IV, may be conveniently effected by an intermittently operative press, indicated at 54 in Fig. VII; for instance, by mechanism vertically reciprocatory at uniform intervals of time, and comprising punching dies 53 adapted to notch the opposite edges of the web as indicated in Fig. IV. The uniform length of the web sections 55 between the successive modified regions 46 thereof being determined solely by the chronological correlation of the movement of the feeding mechanism and the pressing mechanism aforesaid; the distance between said two mechanisms is negligible unless it is desired to have said feeding mechanism grip the web in definite relation to each modification 46 thereof. However, in the latter case, the relative location of the two mechanisms or, at least, the total length of the web between them, must be varied in correspondence with the predetermined extent of the feeding movements of said rollers 47, so that said total length bears aliquot relation to the extent of said individual sections 55. In other words, the distance between the

feeding mechanism and the pressing mechanism, or the extent of the web between said two devices, must be varied in correspondence with variations in the circumferential extent of the cams which determine the length of the successive feeding movements. Such relative variations are conveniently effected by shifting the press 54 longitudinally with respect to the web 45, and selectively engaging the guides 56 of said press with suitable guideways 57, which are disposed at convenient intervals as shown in Fig. VII.

I do not desire to limit myself to the precise details of construction and arrangement herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:—

1. The combination with means arranged to impress an intermittently progressed web; of rollers capable of continuous rotation, arranged to intermittently engage and disengage the opposite faces of said web, in definite relation to the impressions thereon; means arranged to effect a relative adjustment between said impressing means and feeding mechanism; shafts for said rollers; cams on one of said shafts arranged to intermittently effect the separation of said rollers and release of said web; and means arranged to adjustably vary the extent of effective surface of said cams in definite relation to the variable positions of said rollers and impressing means.

2. The combination with a pair of opposed rollers, capable of continuous rotation and arranged to engage the opposite faces of a web; of shafts for said rollers, extending in parallel relation and capable of relative movement toward and away from each other; cams on one of said shafts, having high surfaces with steel blocks at the initial ends thereof; cylindrical disks mounted on the other shaft, having steel plates arranged to register with said steel blocks and effect the relative separating movement of said rollers, and thereby release said web.

3. The combination with means arranged to engage the edges of the opposite faces of a web having notches at equal intervals along said edges, comprising opposed rollers capable of continuous rotation, having lateral projections arranged to register with said notches and support the edges of said web at its minimum width; of parallel shafts for said rollers, capable of movement toward and away from each other; cams carried by one of said shafts, arranged to intermittently separate said rollers to intermittently shift said web; and means comprising rotary leaves carried by said cams, arranged to adjustably vary the circumferential extent of their effective surfaces to vary the length of the intermittent movements of said web.

4. The combination with means arranged to engage the edges of the opposite faces of a web having notches at equal intervals along said edges, comprising opposed rollers capable of continuous rotation, having lateral projections arranged to register with said notches and support the edges of said web, at its minimum width; of parallel shafts for said rollers, capable of movement toward and away from each other; cams carried by one of said shafts arranged to intermittently separate said rollers, to intermittently shift said web; and means arranged to adjustably vary the circumferential extent of their effective surfaces, to vary the length of the intermittent movements of said web.

5. The combination with means arranged to notch a web at uniform intervals of time; of means arranged to intermittently progress said web between successive notching operations, and comprising opposed rollers capable of continuous rotation, having lateral projections arranged to register with said notches; means arranged to effect a relative adjustment between said impressing means and feeding mechanism; shafts for said rollers capable of relative radial reciprocation; cams carried by one of said shafts, arranged to shift it toward and away from the other shaft, to engage and disengage said rollers with respect to said web, and thereby shift said web intermittently.

6. The combination with means arranged to notch a web at uniform intervals of time; of means arranged to intermittently progress said web between successive notching operations, and comprising opposed rollers capable of continuous rotation, having lateral projections arranged to register with said notches; means arranged to effect a relative adjustment between said impressing means and feeding mechanism; shafts for said rollers capable of relative radial reciprocation; cams carried by one of said shafts, arranged to shift it toward and away from the other shaft, to engage and disengage said rollers with respect to said web, and thereby shift said web intermittently; and, means arranged to vary the effective extent of said cams, to vary the extent of the intermittent movements of said web.

7. Mechanism arranged to progress a web having regions of different thickness; comprising rollers arranged to oppositely engage the edges of said web; shafts capable of movement toward and away from each other; a sector having a radius greater than the radius of said rollers, arranged to engage the web at its regions of minimum thickness; and, cams carried by one of said shafts having high portions arranged to alternately

separate said rollers and permit them to engage the web, to intermittently progress the latter in accordance with the effective extent of the high portions of said cams.

8. The combination with opposed cylindrical feed rollers arranged to grip a web between them; of shafts for said rollers; cylindrical disks carried by one of said shafts, spaced from the roller on said shaft; and cams carried at the opposite ends of the other feed roller arranged to encounter said disks and separate said feed rollers during part of their rotary movement.

9. The combination with a pair of opposed rollers, capable of continuous rotation, and arranged to engage the opposite faces of a web; of shafts for said rollers extending in parallel relation, and capable of relative movement toward and away from each other; cams on one of said shafts having high surfaces with steel blocks at the initial ends thereof; and, cylindrical disks mounted on the other shaft arranged to be engaged by said cams and effect relative separating movement of said rollers and thereby release said web.

10. The combination with means arranged to impress an intermittently progressed web; of rollers capable of continuous rotation, arranged to intermittently engage and disengage the opposite faces of said web in definite relation to the impressions thereon; means arranged to effect a relative adjustment between said impressing means and feeding mechanism; shafts for said rollers; cams on one of said shafts arranged to intermittently effect the separation of said rollers and release of said web, and formed of a series of independently oscillatory leaves each having high surfaces provided with steel blocks at their initial ends and means securing said leaves in relatively rigid relation; and, cylindrical disks carried by the other shaft, arranged to coöperate with said cams to separate said rollers and thereby release said web.

In testimony whereof I have hereunto signed my name at Bordentown, New Jersey, this tenth day of August 1908.

GEORGE W. SWIFT, Jr.

Witnesses:
Thos. E. Newbold,
R. H. Aaronson.